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EDITORIAL.

EUROPEAN CHRONICLE.

Bois Jerome, 14th of December, 1914.

ABOUT ROARING.—This question is one which has always been of great interest to veterinarians and especially has it increased since the valuable contribution that Prof. Williams has given to its treatment by the operation, which carries his name, and which has found such a number of successful applications as our friends of the REVIEW have been able to judge by the records published by the English professor, Hobday.

It is on this account that I resume here some facts which I find related from German publications in the *Revue Generale* of Panisset.

The first that I read of is on *roaring due to the hypertrophy of the left thyroid gland.* This article was specially attractive to me, as it reminded me of one similar case, upon which I operated years and year ago and which from a worthless condition allowed a horse to resume his place on the turf, where he had at one time been a great winner.

The German article is resumed as follows:

"Classical researches of F. and K. Gunther have established that roaring was due in 96 per cent. of the cases to a paralysis of the left laryngeal muscles (posterior, transversal and lateral crico-arytenoideus), under the influence of recurrent paralysis of the same side. The question of knowing in what proportion the laryngeal paralysis is primitive is not yet solved. The examination of the larynx of roarers, made on the occasion of the

surgical treatment of the affection, has shown that the left muscular laryngeal paralysis could be considered as a cause of roaring even in more than has been heretofore stated. Out of 140 horses operated by Eberlein, 137 had crico-arytenoid paralysis, in one there was a tracheal tumour as the cause of the roaring, two were supposed to be due to hypertrophy of the thyroid. They are the subject of this record."

"The first animal, a thoroughbred mare, roared only when she was made to carry the head in some positions. Manifest when galloping, no matter how fast, roaring would stop as soon as the mare did and the head was left free. The left thyroid formed a tumor as big as a hen's egg, slightly rounded and of firm consistency. It was movable, neither hot or painful. The other thyroid was as big as a hazel nut. Laryngeal examination, with the laryngoscope, revealed no asymetry of the vocal cords. Ablation of the tumor was performed with chloral anesthesia. Four weeks after the animal did not roar any more, no matter what was the position of the head. Microscopic examination of the gland showed that the hypertrophy was due to the increase in size of the colloid substance, contained in the alveoli, which had their walls considerably thinned out."

"The second case relates to a horse whose increase of the thyroid gland had been noticed since the last few months. The gland to-day is as large as the fist. It is not warm or painful. Exercised, the horse makes a noise which it is not possible to distinguish from that of roaring. Laryngoscopic examination reveals nothing abnormal."

"The horse was operated. Roaring disappeared. Histological examination revealed the nature of colloid or follicular goitre."

The writer terminates his article by asking if roaring due to such condition, viz., the hypertrophy of the thyroid, can be considered as an inhibitory vice. And he answers in the negative, the trouble though chronic can be cured.

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In another number of the same German paper another article on roaring has been published by Dr. E. Harms. It is a case of globo-cellular sarcoma of the trachea, which is presented as a contribution to the differential diagnosis of roaring.

"On account of the success of the surgical treatment of roaring, the number of patients has become so great that an abundant material has been obtained for observations and study of the disease. All the animals to be operated have been the object of thorough examination, so as to appreciate the degree of the affection. It is while making such that the author observed the case subject of this report:

"Tracheal tumors are rarely mentioned. Few observations exist of tumors following tracheotomy. The respiratory tracts seem not very favorable to the implantation of primitive tumors, nor to the development of neoplasms accompanying generalization.

"The animal in question had been seen by Harms once for abundant epistaxis. Respiratory noise appeared some time after. It has increased when work was heavy, and there was difficult breathing. It soon became such that tracheotomy had to be performed.

"Examination of the nasal cavities showed that there was no tumor or malformation. At rest the inspiration gave a slight, sharp noise which increased by the methodic pressure of the entire part of the trachea that can be explored. On a level with the region where tracheotomy had been performed the exploration makes the animal rebel against it. When the horse is exercised at the rope, after the first round, the acute noise increases, the inspiration becomes longer, the expiration is loud and strong and the mucous membranes become cyanotic. Laryngoscopic examination after exercise shows no alteration. Yet the diagnosis is positive neoformation of the respiratory tracts.

"The trachea is opened at the point of election for tracheotomy and there is exposed a soft neoplasic mass which fills up two thirds of the canal. The tumor is removed, the animal standing, and the wound exposed every day for two weeks to

X-rays. The microscopic examination revealed the nature, a globo-cellular sarcoma.

"The primitive epistaxis might have suggested the idea of a tumor of the nasal cavities, but this was eliminated by the introduction of a probe.

"The supposition of laryngeal roaring could also have been thought of. Epistaxis can be observed at the beginning of the acute laryngeal paralysis and the severity of the affection, the absence of difference in the intensity of the noise by compression of the arytenoids, were in favor of the diagnosis in as much as the deep inspiration could not be attributed to the nasal cavities. The very rapid evolution of the disease at a certain time and especially the entirely negative result of the laryngoscopic examination did permit to eliminate the idea of this diagnosis.

"There remained to know if there was stenosis by obstruction or by compression. Because of the negative result of tracheotomy the obstacle was thought to exist in front of the point of election of this interference and the rapid evolution of the disease favored the diagnosis of a tracheal tumor.

"The classical signs given for neoplasic tracheal stenosis are insufficient to insure the diagnosis. Rhino and laryngoscopic examination is the simplest and most certain process to do it.

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TUBERCULOSIS IN SMALL ANIMALS.—Considering the important part that dogs and cats may play in the contagion of tuberculosis to man, and bearing in mind the influence that its presence in smaller domestic animals may have in the prophylaxy of that disease for humans, it is not surprising that it should have received at the hands of veterinarians the attention that it deserves. I may be allowed to refer to some of them and to consider the conclusions that the several investigations have brought forward.

The first observations relating to tuberculosis of dogs were already presented some time ago in the *Revue Veterinaire* of

Toulouse and were made by Profs. Sendrail, Lasserre and Lesbouyries. The principal part of their work relate to the diagnosis.

For them the clinical diagnosis is quite difficult during life; bacteriology and experimentation must be resorted to. The disease may be suspected if it is already existing since several months. The great emaciation and gradual loss of strength, the cough, acceleration of the respiration, the dyspnoea and the chronicity of the disease will suggest the idea of tuberculosis, and especially if there is besides ascitic pleuritic or pericarditic manifestations.

The experimental diagnosis is considered by those authors:

(a) The searching of the bacillus in the ejected products is rather doubtful, the negative result is not sufficient to deny the existence of tuberculosis.

(b) Inoculation of guinea pigs requires too much time.

(c) The diagnosis with tuberculine is the one to recommend. The subcutaneous injection of diluted tuberculine possesses an undoubtful specific action which is manifested by thermic reaction, general reaction and sometimes also a local reaction. The thermic is ordinarily early and with the authors had reached or even gone above 40 degrees from the 4th or 5th hour after the injection and has remained even superior to that for seven hours.

In relation to the etiology of the disease the contagion by man is generally positive.

As affected animals are dangerous to human beings the question of an early diagnosis seems to impose itself in those subjects.

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Following the publications of the *Revue of Toulouse* in the Panisset *Journal,* from Prof. Douville, a valuable article on *Tuberculosis of Domestic Carnivorae,* where a few principal points are considered.

In relation to the frequency of the disease, Douville establishes it at about 4 to 4½ per cent. The statistic being made

out of 20,000 animals examined when alive or after post mortem. Breed has nothing to do with the development of the tuberculous process, which is met at any age, except in very old dogs, as canine phthisis does not allow them to live long: three or four months' puppies are suffering severely.

In cats tuberculosis is more rare, there is but 1 per cent. of tuberculous among them.

In relation to the etiology, Douville says that the infection can take place either by the respiratory or the digestive mucous membrane, although he inclines to believe that the former is most common. The disease is most frequent in animals that live or accompany their master in public places, where many people may be present and where infecting sputa can be picked up by the animals. In the majority of cases, canine tuberculosis is of human origin.

On the symptomatology the author writes: In most cases the process assumes a chronic form and takes several months before it becomes manifest. At first the symptoms are poorly marked, the animal is dull, sleepy, has capricious appetite, looses flesh gradually.

In the onset, pulmonary tuberculosis gives rise to dry, repeated coughs, with small nasal discharge or perhaps none; the temperature has variations of oscillations, rather elevated in the evening, then the cough becomes thick and is accompanied with nasal discharge, greyish or, by exception, purulent. Auscultation reveals pulmonary or pleuritic lesions, and soon the animal has the characteristic tuberculous features, indications of true physiological breaking down.

Chronic pleurisy is the most common localization. Abdominal tuberculosis is frequently manifested by ascitis. Tuberculosis of the other organs is also considered.

For the diagnosis, sometimes difficult to make, Douville considers that when it is made during life, it must be confirmed by the direct research of the bacillus and by the use of tuberculine.

The former is often negative. It is indeed rarely positive.

The bacilli may be found in the effusion of pleurisis or ascitis. For the latter, Douville's conclusions are based on some hundred thermic records of tuberculous dogs, after the sub-cutaneous injection of tuberculine 8/10th to 1½ c.c., according to the weight of the animal. The reaction takes place from the 5th, 6th or 7th, seldom the 10th, hour. The general reaction is present in about one-third of the cases. Dogs, like bovines, have *accoutumance* to tuberculine, but it lasts only a short time.

The injection of tuberculine sometimes fails in about 40 per cent., says Douville. Sometimes it is dangerous, may intoxicate or be followed by death.

In cats, tuberculine is uncertain or may be dangerous for animals free from the disease.

Cuti-reaction gives imperfect results, also is the ophthalmic. Intra-dermo relation gives results which are imperfect and not as good as the hypodermic. At any rate, both can be used as controls.

To complete those considerations that are presented by French writers, I will extract from the *Annales de Medicine Veterinaire of Bruxelles,* where Professors Hebrant and Antoine have published an article on the *Tuberculosis of Dog and Cat,* relating a number of observations made on living subjects with the history, symptomatology, post mortem and microscopic examination.

For these authors, taking the number of animals they have treated as a base, the proportion relating to the frequency would be of 16 per cent. in dogs and 7.4 per cent. in cats.

The thoracic form of the disease is the most common, then comes the abdominal, the external is the most rare.

Relating to the diagnosis which they consider ought to be always made to confirm the one made by the examination of the animal, in their observations the ophthalmic reaction has given them 5 negative and 2 positive results out of seven tests, the cuti-reaction 4 positive and 2 negative, the subcutaneous 4 posi-

tive and certain; 3 had a temperature of 40 degrees after the starting of the hyperthermy.

The conclusions of the valuable paper from our Belgian confreres are:

1st. Tuberculosis of dogs and specially that of cats is frequent.

2d. Tuberculine reaction with carnivorous suspects of tuberculosis is the best mean for early diagnosis.

3d. Tuberculination by subcutaneous injections is the choice method for dogs and cats, providing the temperature is taken every two hours after the injection, the reaction taking place early. It must be preferred to cuti-reaction or ophthalmic reaction, which are uncertain in their results.

4th. If after subcutaneous tuberculination the temperature should rise to 40 degrees or above, the reaction must be considered as positive.

5th. On account of the probable human origin of canine and feline tuberculosis, it is proper to admit the possible return of the infection to man and to consider for him, domestic animals affected with that disease as dangerous.

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SERO-DIAGNOSIS OF GESTATION.—The diagnosis of pregnancy by the method of Prof. Abderhalden is one which presents to obstetricians a great interest. The reaction of Aberhalden is of great practical value. It has been controlled by many investigators and besides its first application has resulted in many others.

In human medicine it has been the subject of many writings. In veterinary medicine it has received less attention; few researches only have been made in Germany, and Dr. C. Raduleslo-Calafat mentions only two as having been made in France; one in Alfort and the other at the Pasteur Institute.

The method of Abderhalden is based on the principle of the specialization of the albumines. The presence of the embryo is the occasion for the introduction in the blood of the mother of

albuminoid substances foreign to her. Then an antagonistic substance, a ferment of defense, will appear in the blood. If its presence is demonstrated, there is pregnancy.

To realize this, a portion of the organ containing the foreign albuminoid (the placenta) is taken. It is put in the presence of the serum to be examined. If there is in it an antagonistic substance, if there is gestation, the two substances will react on each other and the result shall be the digestion of the second by the first. If digestion takes place, there will be formation of a body belonging to the group of peptones; the problem then shall be to look for the presence of said peptone.

In the publication that is continued by Dr. Radulesco-Calafat, the various steps required to solve the problem are described and with them the technic which he has followed while working at the laboratory of Prof. Moussu at Alfort and experimenting on the value of the method from the veterinary point of view, and its practical application.

The following is the technic that has been used. It is the one given by the author of the method:

A placenta is required, one of a cow, mare, slut or guinea pig. Those of the cow or mare are the easiest to obtain. The cord, membranes, large vessels and blood being removed it is cut in small pieces. These are boiled for 5 minutes in five times their volume of water; the water is decanted and then another 5 minutes boiling, and so on until the water does not come blue any more by the addition of ninhydrine. Ordinarily, thirty minutes of boiling is necessary. When there is no longer blue reaction, when it is negative, the pieces of placenta are kept in chloroform and toluol and are then ready for use at any time, but it is better to test their condition.

The serum of the blood to be examined is taken shortly before the test is made.

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How is the reaction obtained? In the dialysor used there is introduced 1 gram of the coagulated placenta tissue and 2 c.c.

of serum are added. The apparatus is then placed in a recipient containing 20 c.c. of water. Both outside and inside liquids of the dialysor are covered with a coat of toluol and then the apparatus is placed in the autoclave at 37 degrees for 16 to 24 hours. After this lapse of time it is looked at to see if in the filtering fluid products of the separation of the albumines have passed, in which case the presence of gestation is confirmed.

The reaction is positive when, after the addition of 0.20 of a aqueous solution at 1 per cent. of ninhydrid at 10 c.c. of dialysal after boiling for one minute a blue coloration is obtained.

In publishing the results of his experiments, Radulesco-Calafat says that he has made 22 observations and has obtained only four doubtful answers. He mentions those of: 1st. Four-year slut which he knew was pregnant he obtained a blue violet coloration after the addition of ninhydrine; 2d. Of another experiment of control with negative results; 3d. A cow which had calved some time before, she gave a positive reaction which was to be supposed possible, as Abderhalden states that the reaction may occur some 8 to 15 days after delivery; 4th. Of a female goat which was known not to be pregnant, the answer was negative; 5th. A cow in the last months of gestation gave a positive answer, and so on. Out of 22 observations he has obtained 18 positive results and 4 remained doubtful.

It is evident from all of those that the sero-diagnosis of Abderhalden gives good results and that its application to the biological diagnosis of gestation possesses a practical value of the first order.

The technic of the method may yet need improvements, and when these have been made it will be easier of application and certainly render great service to agriculture and be of valuable assistance to veterinarians.

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CHEYNE-STOKES RESPIRATION IN HEAVES OF HORSES.—This peculiar respiratory trouble observed by Cheyne-Stokes and by the name of which it is known in scientific, medical and veter-

inary literature, consists in the alternate succession of respiratory arrests from ½ to ¾ of a minute, followed by a series of respiratory motions almost of the same duration. The arrests being observed always during inspiration.

B—Jerks in expiration.
C—Jerks in inspiration. A—Stops in inspiration.

Fig. I.—Cheyne-Stokes Respiration. Pneumo-gramme obtained with Marey's method.

At the beginning of each series, the motions of respiration are slight, gradually increasing in depth and assuming a character of dyspnoea, to become again slighter and then to make room for another arrest.

It is then a *respiration clearly periodical* or *intermittent,* with greater or less intervals in the respiratory motions.

Such is Cheyne-Stokes respiration, observed first by him in 1816, in man.

The experimental researches that were made to elucidate the phenomena and its causal explanations are numerous.

Traube places it in the hyperexcitability of the respiratory centers. *Rosenbach* explains it as the result of the fatigue of the same centers.

Unverricht believes it due to the regulating troubles of the cerebral cortex upon the respiratory automatic centers situated in the bulb.

On this the experiments of *Pachon* have demonstrated that the periodic respiration is due to a deficiency of the normal exciting action exercised by the brain upon the bulb.

Leaving aside this field of pathogenic inquiries and looking into the clinical presence of the trouble, it is noticed that it has been observed most frequently in intracranial diseases,

cerebral oedema, apoplexies, cerebral tumors, uremia and cholemia when these diseases have a compressive, anaemic or toxic action upon the medulla oblongata. It has also been present in fatty degeneration of the heart on account of the lack of arterial blood supply in the respiratory centers.

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After these concise general considerations, Professor J. Poenaru, of the high school of veterinary medicine of Bucharest, writes of this disease in relation to veterinary medicine.

In animals *Volland* has published the history of a case where he has observed it in a horse suffering with colics and treated with an intravenous injection of 1 gram of chloride of barium. *Azary* has seen it after a subcutaneous injection of morphine. *Mouquet* in a horse that recovered from a nervous ailment.

To these cases the professor adds another observation of his own.

The animal was in poor condition, lean, with pale mucous membranes. He had no nasal discharge, but a dry cough. Percussion of the chest revealed sounds over the whole extent, and auscultation crepitating and sibilant râles. The pulse was only 50 per minute and the temperature and appetite normal. Submitted to the slightest exercise the horse became out of breath, the nostrils were widely dilated, the ribs raised suddenly were elevated under the skin. The inspiration and expiration had a marked jump and followed by a series of respiratory cessations of 11 to 14 seconds. The animal that had heaves showed consequently the *respiratory periodical motions of Cheyne-Stokes.*

Poenaru completes his remarks in saying: "In our case of pulmonary emphysema there was perhaps an attenuation or fatigue in the sensibility of the respiratory center of the bulb, because of a too reduced flow of arterial blood in the medulla oblongata and that the elements of excitation of the bulb were insufficient to stimulate the respiratory center, hence the manifestation of Cheyne-Stokes."

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RABIES AND RENAL PARASITISM IN DOGS.—Taking as the heading of the record of a case of *Eustrongylus Gigas* in the kidney of a dog, Dr. Carlo Pomella, of the veterinary faculty of Parma, quotes from the work of Nocard and Leclainche in saying: "The diagnosis of a disease as proteiform as rabies, offers "sometimes serious difficulties. The absence of the specific "symptoms of the disease during the entire or partial duration "of its evolution, the analogy of the manifestations observed "with those of morbid conditions of very different origin, the "lack of precise signs found at the autopsy, all of these often "bring about a possible confusion."

To-day all writers agree to these statements of the French authors in relation to the clinical form of rabies. It is true that all those who have studied and observed it have tried not only to prove how dogs, to all appearance sound and healthy, kind and affectionate, could be affected with rabies. But they have also attempted to establish by a special sense of observation what in dogs are the various morbid forms which by their complex symptomatology might be mistaken for rabies.

And it is as the result of this that many forms of disease are to-day spoken of as being likely to promote rabiform manifestations, such as intestinal pains, foreign bodies in the intestines, intestinal helminthiasis, cerebral cysticercosis, some forms of intoxication, distemper, central nervous complications, acute rheumatism, cutaneous irritating applications, the disease of Aujeszky and, finally, the *Eustrongylus Gigas*.

The record of the case reported by Dr. Pomella is just in relation with this. It has for its principal object to show that the presence of this parasite is not sufficient to justify the diagnosis of the absence of rabies and he puts the question, "Can one exclude rabies in a dog that, having died with rabiform symptoms, when at post mortem the kidneys have been found infested with *Eustrongylus Gigas?*" His answer is categoric—No!

If the parasite is found in a dog suspected because of rabiform symptoms and especially if the history exists of his having bitten other animals or people no definite diagnosis can be made

until negative experimental proof is obtained with histological and biological tests. The case of Dr. Pomella is reported as follows, in the *Revue Generale:*

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A five-year-old pointer has had distemper when young, but the disease has left him free from any suspicious manifestations of illness and he has always performed his duties to perfection.

At present the history changes. The dog has never presented any symptoms which would make him suspicious of rabies, but it has been observed that he has less appetite, has frequent vomiting, makes repeated efforts to micturate and only passes a few drops of thick, reddish urine.

When he is examined he is found in a poor state of nutrition, much depressed, with absence of motor troubles, the mucous membranes are yellowish, the cornea not sensitive, pupils not reacting, there is reduced sensibility in several regions of the body, respiration and heart beats reduced, pulse small, thready and soft, hypothermy. With palpation of the abdomen there is detected a tense voluminous body situated in the left anterior region of the body. Catheterization of the bladder is negative. The condition of the dog is precarious and he dies during the night of the examination without having presented rabiform manifestations.

The post mortem revealed nothing very particular except those of the bad condition of nutrition, atrophy of the muscles and general aspect of anaemia in the membranes. After the removal of the stomach and intestines the left kidney attracted attention. It was hypertrophied, rounded, cystic and floating in the abdomen. It was transformed into a fibrous cyst with very thick walls, containing some purulent fluid and three *Eustrongylus Gigas* measuring 50, 45 and 40 centimeters in length. The ureter was obliterated, the bladder empty. The balance of the autopsy showed nothing particular.

From all these lesions and history of the case it is proper

to conclude that uremia was the cause of all the troubles presented by this dog, and substantiate the evidence that if rabiform specific manifestations may be absent in dogs having *Eustrongylus* in a kidney the presence of the parasite cannot exclude the possible rabid infection if these manifestations have been exhibited. A. L.

WE DON'T WANT TO DO IT OVER AGAIN.

We don't want our Army Veterinary Service Bill (H. R. 4541—S. 4541) to be strewn about the legislative chambers in Washington as wreckage when Congress closes March 4th. We hanker to see it put through, instead of being pitched into the waste-paper basket. It is in the greatest peril owing to the shortness of the present session of Congress, which finishes March 4th. It will be killed as sure as preaching unless we can get it brought to a vote within the next two or three weeks, even though all that remains for its enactment into law is to have it voted on favorably on the floor of the Senate. There are a thousand and one ways to kill a bill, and this is one of them—just don't give it the final vote it needs, and let it die. The Senate may do that; for there is the big excuse to give (which is supposed to be unanswerable) that the session is about at an end and the Senate calendar is loaded with heavy bills. An excellent piece of business this—to carry your veterinary bill along to a point where all it needs to make it law is to vote on it on the Senate floor, and then tell you that things could not be helped; there was no way to find an opportune moment to rush the bill through.

The profession is going to get a chance to do the work of putting the bill through all over again, from start to finish, if it "don't watch out." We will have to begin again and plough our way up hill for another two—four—six years; who knows how long? That is a thought we all relish; for we enjoy being set back and having to do the task again—maybe to almost finish and then start over again and over again. We have been doing this

kind of thing on Army veterinary service legislation for several decades. Congress will let us keep on doing it until "the crack of doom" if we don't attend to our business—the business of forcing action in the Senate on this measure, this month, and there end the rough road we have been travelling all these years for the reform of the Army veterinary service.

Action! Action!! This must be our battle cry. Ever action! This month; before Congress closes; action in the Senate! They'll kill the bill there if we permit it. Then returns the tedium; the nausea; the chagrin of having to do the work all over again.

Our hopes are hanging on four men:

1. Senator Chamberlain, of Oregon, Chairman of the Senate Committee on Military Affairs, whose committee passed favorably the bill.

2. Senator Luke Lea, of Tennessee, Chairman of the Senate Military Committee Sub-Committee, which favors the passage of the bill.

3. Senator John W. Kern, of Indiana, leader of the Democratic majority in the Senate.

4. Senator J. Hamilton Lewis, of Illinois, Democratic "whip," who keeps a quorum in the Senate in the interests of his party.

If our bill is to be called up for a vote on the Senate floor, senatorial courtesy requires that it must be done through either Senator Chamberlain or Senator Lea, because they handled the bill in the Senate Committee. The bill cannot be called up and taken care of on the Senate floor by either Senator Chamberlain or Senator Lea until an opportune moment arrives for consideration of bills on the Democratic program other than appropriation bills and administration measures. At that moment the weighty influence of Senators Kern and Lewis, who are for our bill, may be brought to bear to put our measure through.

Our dependence being on these four men, they must be kept continually reminded of our expectations and our hopes. This must be done by having all Senators plead with them for an op-

portunity for consideration of our bill. The bill is not dead yet, but it will be on March 4th unless our influence on our Senators is kept active until it is brought to a vote. G. S.

MORE ABOUT THE POSTPONEMENT OF THE A. V. M. A. MEETING.

We realize that you cannot place any market value on advice until it has been used, but even at the risk of it never being used we are going to differ with Dr. Campbell's article in the January issue of the *American Journal of Veterinary Medicine*. First because we are not sure he is right in his deductions and contentions concerning the postponement of the meeting of the A. V. M. A.; and secondly, because we feel that he has placed too much blame upon the great, broad shoulders of our good friend, Dr. Marshall.

It is a common axiom that our hind sight is better than our foresight, but we are not sure that we could apply this to the decision in postponing the date of our meeting.

After reading Dr. Campbell's article it first occurred to us that he was all wrong, but after due deliberation it is our judgment that our opinions would differ perhaps principally from the difference in viewpoint. Dr. Campbell states "that never before was there such an opportunity as the present to give such publicity to our association, its meeting and its actions;" and he cites that Illinois and Indiana had held two successful local meetings and had good attendance. We doubt if any local meeting would necessarily be a criterion as to the attendance that would be assured the A. V. M. A. when we consider the distance to be traveled and the time and expense that must be taken into account for northern, eastern and western veterinarians to attend a meeting at New Orleans.

Further, from Dr. Campbell's viewpoint, he doubts that the outbreak of foot-and-mouth disease throughout some 18 states would have prevented the attendance of State and Federal offi-

cers. From *our* viewpoint we agree absolutely with President Marshall, that but mighty few of the State officers in the north and east at least could have, or would have, attended. Surely many of the men that are worth while in considering serious matters could not attend with any contentment or satisfaction. In fact, for them to have *abandoned their posts* at such a critical time we believe would have precipitated a just criticism on our profession that we could not satisfactorily explain, and that surely could not be offset by the results of the meeting, had it been ever so successful.

Aside from State and Federal officers, in many rural communities a large majority of the most capable and progressive practitioners were either drafted into State service or kept extremely busy by being in constant touch with the livestock interests of their community.

Take these classes from your meeting and I fear the showing that the profession would make in the South would be rather lamentable and disappointing to our loyal southern friends.

We have said that we thought President Marshall was asked to bear too much of the criticism, and we believe he was; we appreciate the fact that propriety and modesty seal his lips and hence a word in his defence.

True, it is that Dr. Campbell and we, and, yes, the government and State employees, all probably knew what a task was ahead of those interested in the livestock sanitary control work when it became known that apthous fever was so widespread, but did *all* the members who were to cast their ballots realize the *gravity* of the situation, and would a post card ballot with *less* information and *less* statement of *facts* have been a fair and honest guidance to those who were not in a position to appreciate the situation? President Marshall put the facts squarely before the members; it was their privilege to vote just as they felt; those who were *not interested* in the control of Foot-and-Mouth Disease and cared little for the companionship, and part that many of the Solons of our profession would take in the next meeting could, and probably did, vote for the non-post-

ponement of the meeting. Others, and, we believe, the large majority, voted *for* its postponement. We feel, therefore, that the method which President Marshall and the Executive Committee saw fit to adopt was good, sound logic.

As it now stands, Dr. Campbell feels that the meeting should have been held and we feel that it should have been postponed. Let us meet each other half way. We'll agree that February and March is apt to be a busy time for the practitioner and college man, but Easter Holidays are coming, and while a little late, it is true, still we will have by that time gone through the experience of another epizootic and we will have mastered it and can add another successful triumph to our experiences.

If we cannot arrange a meeting before, why not then? Let us go and enjoy the southern clime at a time when the bluebirds return to us, and the crocus and woodland violets are peeping through, and our hearts are full of good cheer and good fellowship. Even the *grouchiest* of us at such a time could not fail to feel and appreciate the double distilled hospitality that has made Dixieland famous the world over. J. F. D.

A SUMMARY OF THE SITUATION ON FOOT AND MOUTH DISEASE is published in this issue; beginning on page 574.

DR. FERGUSON FIGHTS FOR CLEAN MILK FOR EVANSVILLE.—At a recent meeting of the Southern Indiana Dairyman's Protective Association in Evansville, that State, the milkmen, while they endorsed a legislative measure that would provide for a State-wide tuberculin test, evinced keen hostility toward a milk ordinance that provided for the operation of such a test for milk sold in Evansville. When the arguments against the test got on his nerves, Dr. Ferguson could not refrain from taking the floor, and, " to the pathological objections to the test," says the Evansville *Sunday Courier,* " the strongest answer was given by Dr. A. T. Ferguson." More and more the veterinarian is taking his place in the management of civic affairs. We congratulate our good friend, Dr. Ferguson, who always expresses himself as he feels.

ORIGINAL ARTICLES.

THE USE OF DRUGS IN THE TREATMENT OF DISEASE CAUSED BY NEMATODE WORMS.*

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The class of nematode worms includes a large number of species which infest the domestic animals. Many of these species are extremely common parasites, but usually only cause disease when in large numbers and under certain conditions. As a rule, the most serious trouble is experienced amongst young stock. Some species often set up outbreaks of disease which may be likened to and in many cases are far more serious than contagious bacterial affections. As a rule, each species of nematode develops only in one, rarely two or more species of domestic animals. When taken up by its host it passes to and occupies quarters in certain specific situations. Frequently several species of worms are associated in the one animal.

The serious effects of invasion by these parasites vary very considerably and are frequently not characteristic. They may be local, depending on the position of the parasite, or general. The general symptoms associated with the presence of worms are unthriftiness, debility, and anæmia. Occasionally ascarides cause nervous symptoms. As for local symptoms, the nematodes in the alimentary tract may be responsible for diarrhœa. Ascarides occasionally cause impaction and even rupture of the bowel in horses; in the respiratory tract the nematodes cause bronchitis and pneumonia. It must, however, be remarked that some species of nematode worms appear to produce no symptoms, and even although those which occasionally do so may be present in considerable numbers, the host may appear in excellent health.

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This may be due to the method of action of these animal parasites in producing disease. They may act mechanically, produce toxins, or inoculate bacteria into the tissues of the host. Accumulating in great numbers in the intestines, ascarides may cause obstruction and by compression they may occasion even rupture and perforation of the bowel wall. In the bronchi and bronchial tubes strongyles may obstruct the passage of air. Penetrating the circulatory apparatus the embryos of filariæ may cause the production of emboli and aneurisms. Provided with an oval armature, certain worms, such as ankylostomes and sclerostomes, injure the mucous membrane, suck blood, and inflict lesions which may be accompanied by hæmorrhage. Mechanical irritation may provoke reflex nervous symptoms, such as convulsions or epileptiform fits, in the hosts of ascarides, but these troubles may also be attributed to the action of toxins formed by helminths. Leroy has observed the perienteric liquid of the *Ascaris equorum* kill a dog in half to one hour in the dose of 8 c.c. to 10 c.c. per kilo body-weight. Weinberg and Julien injected the sterile liquid from the same source into the conjunctival sac and nasal chambers of horses and observed a marked local irritation in animals not carriers of ascarides, but the reaction was not shown by carriers, probably because they had acquired some immunity against the toxin. Hæmolysins and anti-coagulins have been shown to be developed in the bodies of certain worms, ankylostomes, sclerostomes, ascarides. In the *Strongylus equinus*, hæmolysin is present in largest proportion in the cephalic portion of the worm. It may be said that these agents are developed by the worms for their own use in dealing with the blood derived from their hosts, but it is probable that some toxins are absorbed. This is more likely to occur when the worms die, as in the case of *Bibothriocephalus latus*, and then anæmia, emaciation, etc., result. With reference to the inoculation of bacteria, Weinberg has examined the intact tumors of the *Spiroptera megastoma* of the horse's stomach and found numerous bacteria in them. Dionisi attributes the pulmonary lesions in sheep affected with *S. filaria* to *Bacillus ovisepticus*. Tricocephales, oxyurides, sclerostomes,

spiroptera, which are capable of fixing themselves to the intestinal wall, inoculate the germs which adhere to the surface of their body. The ascarides favor infection by rubbing against the mucous membrane. Adult worms, their embryos or larvæ, emigrating into the bile ducts, peritoneum, circulation, and different organs, transport bacteria with them. The results will depend upon the nature of the bacteria inoculated.

The action of nematodes is therefore not absolutely dependent on numbers and on depriving the host of its nourishment. The serious results produced by their presence depend upon the toxicity of the toxins manufactured by the worms, the susceptibility of the host, the mechanical damage the parasites may do, and the variety of the bacteria they inoculate. In the latter case, when the bacteria enter the tissues and produce disease they are the agents to which the attention of the clinician must be directed.

The first object in all treatment of disease is to remove the cause: in this case the nematode worms. The removal of the worms is brought about by means of anthelmintics. The anthelmintics commonly used are oil of turpentine, coal tar creosote, carbolic acid, lysol, empyreumatic oil, naphthalin, thymol, santonin, arsenious acid, potassium antimony tartrate, common salt, sulphate of copper, sulphate of iron, areca nut, male shield fern, chenopodium, picrate of potash, kamala, kousso, quassia, oil of cade, carbon disulphide, asafœtida, eucalyptol, benzine, pomegranate, pumpkin seeds. The action of these drugs is to destroy or in some way affect the worms so that they are easily expelled from the body. They can thus only produce their effects when the worms are situated in a tube which leads to the exterior of the body. They do not act upon the nematodes in the tissues and their action is hampered when the worms burrow into the walls of the tube in which they live. Many of the drugs do not destroy the worms for a long time when in contact outside the body, and it is therefore probable that they only lower their vitality inside the body. Santonin, *e. g.*, does not destroy round worms; it would appear that it to some extent makes them drunk, so that they are no longer able to maintain their equilibrium

in the intestine and they are swept out by the movements of the bowel itself or by the purgative medicine which has been introduced (Lauder Brunton). In the use of these drugs care must be taken not to use toxic doses, but a sufficient quantity and proportion to exert a direct action upon the parasites. None of the agents mentioned is absolutely specific for certain species of nematodes, and hence the various anthelmintics are employed, either singly or in combination, against all the nematodes, according to the tolerance of the patient, the cost, convenience in administration, their efficacy, or the idiosyncrasy of the practitioner. The mode of administration of these remedies is affected to some extent by the position of the parasites. The most common nematode parasites occupy some part of the alimentary canal or the respiratory tract. When dealing with the worms in the stomach or intestines it is necessary to have these organs as empty as possible by withholding food and water for twelve or twenty-four hours to allow the drug, without undue dilution, to come into direct contact with the parasites. The anthelmintic may be accompanied or followed by a laxative, the latter is usually unnecessary when there is diarrhœa. The difficulties attending the removal of the worms can only be noted when the particular cases are referred to. When the worms are expelled the symptoms will disappear, unless some serious damage has been done to the tissues of the host. In the latter case treatment often fails. On that account anthelmintics are, in many instances, only of service in the early stages of disease, in some cases even before symptoms are set up.

The second part of the treatment consists in counteracting the effects of the worms by a generous diet and a course of tonics. Some of the anthelmintics, such as arsenic and sulphate of iron, will act in this way. If diarrhœa is present, it ought to be relieved by astringents. A generous diet is a most essential part of the treatment and is often more important than the drugs usually recommended. As a rule, parasites flourish more readily in the body of a debilitated animal. It may be that in debility the media furnished by the host are more favorable to the de-

velopment of the parasite, or that in a stronger body antitoxins are formed which inhibit the development of large numbers of worms or prevent their effects.

A third part of the treatment consists in preventing reinfection or preventing infection of susceptible animals sufficient to produce disease. It may be taken as an axiom in helminthology that each worm in the body develops from an egg, embryo or larva, which has entered from without. Worms do not go on multiplying indefinitely within the host. Hence the degree of possible infection depends upon the amount of contamination of materials taken in by a susceptible animal. At pasture this is often associated with overstocking. Reinfection can only be prevented when the ports of entry and the life-history of the worms are known. So far as we know, the large proportion of the nematode parasites enter the body with the food or water. In what way may drugs be used as preventive agents? In herbivora common salt should be added to the food or free access given to it. It will destroy some of the embryos or larvæ picked up, as well as stimulate digestion. Infection often occurs at pasture, and hence on infected lands the application of common salt or sulphate of iron in the proportion of 3 to 5 cwt. to the acre in the spring will be of service in destroying the eggs, embryos or larvæ which have survived the winter. When animals are known to have been exposed to infection, periodic doses of anthelmintic medicine should be given at intervals, even before the symptoms appear. This is a measure especially applicable amongst young herbivora. It is often successful with cattle, sheep and horses when they are grazing on infected pastures, especially low-lying, marshy lands, in preventing serious outbreaks of diseases due to strongylidæ and other worms. Indeed, it is attended with greater success than curative treatment when the symptoms of disease have been produced.

I shall now refer to particular cases, according to the position of the parasite, and in doing so will try to avoid repetition.

NEMATODES OF THE ALIMENTARY CANAL.—In equines one of the most common anthelmintics used is oil of turpentine in

doses of 1 to 2 oz. It is given in the morning fasting, either as a single dose with one pint of linseed oil, or administered on two or three successive mornings in a pint of milk and followed by oil or other purgative. Potassium antimony tartrate is another good agent given in 1 to 4 dr. doses on several successive mornings in a mash of bran or in a little oats and then followed by a laxative, such as linseed oil or aloes 4 dr. and calomel 1 dr. A convenient method with foals is to give no water the evening before dosing, dissolve the drug in a pail of water and offer it in the morning before feeding (Grimme). If the diet is laxative, such as grass or bran mashes, a purgative may not be necessary. This drug is especially useful against *Ascaris megalocephala,* it is not always efficacious, but may be repeated, is safe and improves the condition of the horse. White arsenic in doses of 3 to 10 gr., together with sulphate of iron 2 dr. is also a good anthelmintic, given in the oats or in a ball each morning for seven days and then followed by a purgative. Copper sulphate in 1 to 2 dr. doses, given with a vegetable bitter in the same way as arsenic, is also very useful. Other drugs used include santonin ½ to 1 dr. doses (this drug does not appear to be so effective in horses as in dogs), carbon disulphide 3 to 4 dr. for adults, 1½ to 2 dr. for foals, in gelatine capsules, given three or four times at intervals of two hours after starving for twelve to twenty-four hours and followed in twelve to twenty-four hours by linseed oil or aloes, carbolic acid, or lysol 1 dr. in a pint of milk daily for a few days, followed by a purgative, thymol 10 gr. to 1 dr., depending upon the age, in ball or in suspension in milk, administered for three days and followed by a laxative and after an interval of four days, if necessary, continued again. In this country it is common to give a mixture of these agents in powder in the feed or in a ball, *e. g.,* white arsenic 5 gr., sulphate of iron 2 dr., potassium antimony tartrate 2 dr., each morning for seven days, followed by a purgative on the seventh day. The agents are of very great service against *A. megalocephala,* which occupies the small intestines, sometimes the stomach and colon, but they may require to be repeated after an interval in larger

doses. In some cases, however, the first symptoms produced by the presence of the worms in foals and young horses are those of impaction or rupture of the bowel. In the latter case nothing can be done to save the animal, and in the former it is not easy to discover the cause of the impaction. Fortunately, a purgative often expels some of the worms. Of the nematode worms of the intestinal tract of the horse the most serious are the various species of the strongylinæ (Sclerostomata), of which the types are the *S. armatus* and *Cylicostomum tetracanthum.* The adult worms inhabit the cæcum and the double colon and are often attached to the mucous membrane. The larvæ are often embedded in the submucosa of the bowel and the *Strongylus vulgaris* in its larval form invades the anterior mesenteric artery and its branches to the cæcum and colon, occasionally the cœliac axis and other vessels, causing endarteritis, aneurism, and thrombosis of these vessels. During the past ten years I have found these worms in the anterior mesenteric artery in 80 per cent. of horses. The adult strongylinæ in the bowel are very difficult to get rid of and certainly the larvæ in the bowel wall, and the *S. vulgaris* in the vessels is not acted upon by the agents we have already noted. Thymol was introduced in the hope that it might be of service, but it also only acts upon the nematodes in the bowel. An interval is allowed between the courses of medicine in the belief that the larval worms may pass from the bowel wall into the lumen. One reason that the action of vermicides is not very certain, even on the adult strongylinæ in the cæcum and colon, is that the agents given are partly absorbed before they reach these organs and are very much diluted in the contents of these organs, which always contain a huge mass of ingesta, even after withholding food or fluids for many hours or days. Hence arsenic in its solid form is more likely to exert a vermicidal effect upon the worms than some of the other more soluble agents. To be of service anthelmintics must be used before acute symptoms set in or the disease is far advanced.

Occasionally an enteritis is set up by the worms of the tetracanthum group and death follows very rapidly, even before any

treatment can be adopted, especially in foals and young horses. This may be the first indication of infection. When the larvæ are present in large numbers in the submucosa of the bowel, anæmia, debility, emaciation, and even diarrhœa set in. Here not only have we to deal with a worm infection, but also an invasion of the pathogenic organisms carried by these worms, as indicated by Weinberg. Anthelmintics in these cases are of no use, better results will follow a generous diet, oats, hay, milk and eggs, and a course of general tonics, liquor arsenicalis, carbonate of iron, quinine sulphate, but even then the prognosis is not favorable. The lesions in the anterior mesenteric artery due to *Strongylus vulgaris* are occasionally followed by rupture of that vessel in young animals and a fatal hæmorrhage results; sometimes large numbers of emboli are cast off and set up an embolic enteritis. In adults, however, aneurism and thrombosis of the mesenteric artery are frequently present without causing trouble, symptoms of colic which have been attributed to this cause can, as a rule, be prevented without any reference to these worms. Bockberg recommends in these infections in foals the intravenous or subcutaneous injections of atoxyl. In an outbreak which he dealt with among forty foals, eight died before treatment, and of the others twelve showed very marked symptoms of infection. The doses of atoxyl used varied from 3 to 7½ gr., in some cases as much as 15 gr. was given, and in one case 22½ gr., in 1 per cent. solution with 1 per cent. sodium chloride in water. Great improvement followed. Dorn recommends the intravenous injection of a 3 per cent. solution of atoxyl.

The Oxyurides, *Oxyuris curvula* and *mastigodes,* frequently infest the colon and rectum of horses. In the rectum they sometimes cause irritation and rubbing of the tail. The anthelmintics already noted given by the mouth have no marked effect upon these worms; they may act as adjuvants. The most efficacious treatment consists of the use of vermicide enemata, such as a 5 per cent. solution of common salt, 1 per cent. solution of lysol, an injection of vinegar, soap and water, an infusion of quassia or tobacco (1 oz. shag tobacco to 30 oz. water), perchloride of

iron (Tr. ferri. perchlor. 1 to 2 oz. to 2 quarts water). One quart of one of these solutions is injected each morning for three or four days, after removing the fæces by hand from the rectum. The symptoms soon disappear. *Spiroptera megastoma* and *microstoma* are sometimes found in the stomach, the former producing small tumors in the stomach wall, although they produce no evidence of their presence during life. Major Martin, in Poona, noted a case of rupture of the stomach due to this cause. Spiroptera were almost constant parasites of equines in that region. On experiment he found that the worms were not dislodged or affected by anthelmintics; even arsenic in 20 gr. doses twice daily for three days had no effect upon them.

In ruminants Strongyli of a number of different species are parasitic in the abomasum and intestines, causing very serious symptoms of gastro-enteritis, with anæmia. Of the strongyles of the abomasum, among sheep the most common in this country are *Hæmonchus contortus* and *Strongylus cervicornis,* and in cattle *S. convolutus* (*Ostertagia ostertagi*) and *Strongylus gracilis* (*Trichostrongylus extenuatus*). Some of these parasitic in the intestines are the *Strongylus ventricosus* (*Cooperia oncophora*), *Uncinaria cernuum* (*Bunostonum trigonocephalum*) in the small bowel and the *Sclerostomum hypostomum* (*Chabertia ovina*) in the large bowel of sheep and goats. Although some of these worms are common in ruminants of all ages, it is in young animals grazing on certain infected pastures that they cause disease, in lambs from three to nine months old, in cattle from six months to two and a half years. As to the action of vermicides on them, McFadyean, experimenting with specimens of the *Strongylus convolutus* isolated from the contents of the abomasum of an ox, observed that they were killed by 1 per cent. lysol in five minutes, and after twelve hours' exposure to ½ per cent. lysol and chloroform water, but some only were destroyed in that time by 1 per cent. carbolic acid while in oil of turpentine 1 in 40 of milk, Fowler's solution of arsenic 1 in 40 of water, the worms remained active. Oil of turpentine is often used as the anthelmintic in these cases in doses of ½ to 1 dr. to a sheep in 1 oz. of milk, and

2 oz. to young cattle given in a pint of milk or gruel in the morning. Coal tar creosote is especially recommended by Stiles. It has given very variable results, and this may depend to some extent on its variable composition. In a 1 per cent. solution the doses are: For lambs four to twelve months old, 2 to 4 oz.; sheep, one year old and over, 3 to 5 oz.; calves, 5 to 10 oz.; yearling cattle, 1 pint. One dose is said sometimes to be sufficient to effect a cure in sheep. Thymol in doses of 30 gr. to a lamb, 50 gr. to a yearling, 2 dr. to cattle, made into a paste with water and given in ½ pint of water to a sheep, or 1 pint to an ox, has given good results in the hands of some practitioners. It may be combined with creosote, and is repeated in a few days.

As the result of the experiments of McFadyean, already refered to, the hope was entertained that in lysol was found a specific agent against Strongyles of the abomasum and intestines in ruminants. For young cattle the dose advised was 4 dr. in one quart of water, followed at intervals of two or three days by doses of 2 to 4 dr. In sheep half a pint of 1 per cent. solution has been given, followed by good results; but some owners assert that violent quivering of the muscles and immediate death may follow its administration. A common mixture used for sheep is ℞ chloroform 10 minims, ol. tereb. ½ to 1 dr., lysol 10 minims, aquæ 2 oz. given three or four times in a fortnight. Arsenic, in my hands, has given better results than other drugs, in cattle from 5 to 10 gr., together with 2 dr. sulphate of iron; in sheep, arsenic 2 gr., iron sulphate 10 gr., given daily for six days in oats or bran. Dr. Theiler has shown that 15, 30 and 45 gr. arsenic in single doses cause no ill effects in adult sheep, whether they are watered twenty-four hours after or immediately after dosing. In sheep this method of treatment has the advantage that no drenching or handling is required. Drenching of sheep is attended with some danger and difficulty in a large flock. Copper sulphate is another remedy which may be given either dry in the food or in a 1.2 per cent. solution. In South Africa it has been recommended in a drench as a safe remedy in sheep. According to Dr. Theiler 22 gr. is a safe dose for an adult sheep, whether the

animal is watered directly after the dosing or only twenty-four hours later. The addition of liquid to the copper sulphate increases the toxicity of the drug. It is used in doses of 4 gr. for lambs three months old; 8 gr. for lambs six months old; 10 gr. for sheep one year old; ½ to 1 dr. for calves. Other drugs used are male shield fern, benzine, picrate of potash, Charbert's empyreumatic oil, and tobacco. In all cases before administration the animals are taken up and not allowed food or water for twelve hours. With all the agents used variable results have been obtained and recorded, and they do not appear to correspond with the experiments made with the drugs upon worms outside the body. This may be due to one of two causes. In the first place all drugs taken in by the mouth pass directly into the rumen and reticulum and mix with the ingesta there before passing through the omasum to the abomasum and intestines. It has been asserted by Stiles and others that agents given while the animal is in the standing position or by probang are carried directly through the œsophageal groove and omasum to the abomasum. That I have shown on several occasions to be quite an erroneous belief. Hence, drugs given in fluid form are diluted to a large extent before they can act upon the strongyles in the abomasum, and even to a greater degree in the intestines. Probably on that account I have noted quite frequently at *post-mortem* examinations large numbers of live worms in the abomasum of animals which have received vermicidal treatment. In the second place, treatment is often not commenced till the symptoms are far advanced and the tissues not likely to recover from the damage which they have suffered, even although the strongylidæ are removed. Greater success has been attained in the treatment of disease due to *Hæmonchus contortus* in sheep than in the case of smaller strongyles, probably because the latter penetrate into the glands of the abomasum. The smallest of the species thus often cause more severe losses than the larger species. Those worms which have entered the mucosa are not acted upon by the medicinal agents used. In cattle tonics and astringents are administered after the anthelmintics, in order to relieve the symp-

toms of diarrhœa and anæmia. Reinfection is difficult to prevent unless the animals are taken up and housed. In all cases a generous diet, such as cakes and oats, is absolutely essential, and the measures adopted which have been noted in connection with the prevention of reinfection generally. Worm nodules in the intestines of native cattle and sheep, due to Œsophagostomata, are not observed in this country. As a rule, they do not interfere with the fattening of cattle and sheep, but in any case anthelmintics will only act upon the adult worms in the lumen of the bowel, they will have no effect upon the larvæ in the worm nodules. Marotel and M. Velu have met with enzootics of œsophagostomiasis in bovines, due to the *Œsophagostomum radiatum,* in which the symptoms were similar to those of gastro-intestinal strongylosis, and the mortality was great. No medicinal treatment proved of any service.

Ascarides are uncommon in the small intestines of ruminants in this country. They may be treated with success with any of the anthelmintics used for strongyles, and followed by a purgative.

In swine the most common nematode parasites are Ascarides (*Ascaris suilla* or *suum*). They develop in the small intestines, but occasionally pass into the stomach and bile ducts. In young swine one of the most common symptoms is convulsions, especially after feeding. A dose of 10 to 20 gr. of calomel is often sufficient to dislodge these worms. For sucking pigs Bru recommends calomel given in milk, followed by castor oil; for older pigs on a mixed diet, decorticated castor meal 1½ to 2 dr. associated with calomel, powder of male shield fern, wormwood and pomegranate seeds, then replaced by sulphate of magnesium or soda. The symptoms disappear rapidly. Extract of male shield fern (1 to 2 dr.) or areca nut (2 to 4 dr. for adults, 1 to 2 dr. for young pigs) given daily in the morning in milk or flour for a few days, and followed by a laxative such as calomel, or calomel and jalap, is also very useful. A similar form of treatment might also be tried in the uncommon conditions where a gastric catarrh is set up by the *Gnathostomum hispidum* or *Arduenna strongy-*

lina. Reinfection is prevented by giving vermifuge medicines to all incontact pigs, destroying the eggs and parasites in the manure by mixing the latter with lime, and disinfecting the styes and troughs with boiling water.

In the dog and cat Ascarides (*Belascaris marginata* and *Belascaris cati*) are extremely common parasites. They usually occupy the small intestines, but occasionally enter the stomach. In puppies only a few weeks old they frequently set up symptoms; but one must note that many puppies are dosed for worms when they are really suffering from distemper. Santonin is one of the best anthelmintics against these worms. It is given in doses of ⅛ gr. per lb. body-weight, but not more than 4 gr. should be given in a single dose. It is administered in pill with calomel (¼ to 3 gr.), or jalapin (⅛ to 2 gr.), or suspended in syrup of buckthorn (1 to 4 dr.) in the morning, after fasting for twelve hours. It may be repeated if necessary after an interval of three days. On account of the toxic nature of the drug great care must be taken in its administration to toy puppies; indeed, it should not be applied till the puppies are eight weeks old. Under that age a simple laxative may be given, which often brings away quite a number of worms. To the laxative 1 to 2 minims of oil of chenopodium might with safety and advantage be added. Other valuable drugs used are extract of male shield fern (8 to 60 m.) in pill or capsule, kamala (½ to 2 dr.) in milk, freshly ground areca nut (in the proportion of 2 gr. per lb. body-weight) in pill, capsule or suspension in syrup of buckthorn, thymol (3 to 8 gr.) in pill or capsule, either accompanied or followed in one or two hours by a laxative. If the dog vomits the medicine it may be repeated in a few days, preceded by a stomach sedative such as bismuth carbonate or chloretone.

There have also been recommended cortex of pomegranate, pumpkin seeds and oil of turpentine. As a rule the drugs which I have mentioned are very efficacious. When an animal is affected with fits attributable to these worms, it is necessary to administer a course of sedatives such as bromide until the worms are got rid of. To prevent the worms in puppies it is advisable to give

the bitch a dose of vermifuge medicine not later than the sixth week of pregnancy, and in addition to destroying the fæces and disinfecting the kennel wash the mammary glands with a disinfectant solution. Ankylostomiasis in the dog, due to *Ankylostoma caninum* and the *Uncinaria stenocephala* which infest the small intestines, appears to be rare in this country. In the cat a similar condition has been observed in Italy. The treatment employed is similar to that for Ascarides, but it is far more difficult to get rid of the worms on account of their attachment to the mucous membrane. Extract of male shield fern and kamala are specially recommended. Mégnin advises kamala in doses of 45 gr. to 1 dr. with 3 to 7 gr. of calomel and .075 to .09 grm. of arsenic. Thymol or eucalyptol might be useful judging from the results obtained with ankylostomiasis in the human subject. A generous diet (milk, eggs, flesh-food), cod-liver oil and tonics are very necessary to counteract the anæmia and debility. When the disease is advanced treatment is of little service. Animals frequently reinfect themselves, and it has to be remembered that the infection may occur not only through the food and water, but even through the skin (Cuillé). The kennel and food utensils must be thoroughly cleansed and the fæces destroyed.

In infection with *Spiroptera sanguinolenta* in the dog, or *Ollulanis bicuspis* in the cat, the condition is not diagnosed during life, and treatment is purely palliative, devoted to relief of the symptoms.

Nematodes of the Respiratory Tract.—In the ass, occasionally in the horse, *Strongylus arnfieldi* (*Dictyocaulus arnfieldi*) infests the bronchial tubes, and in large numbers sets up a bronchial catarrh. It is probable that the same treatment employed for cattle might be equally beneficial for equines, but these parasites are often present in the ass without causing serious trouble. Among young cattle from six months to two and a half years bronchitis is caused by the presence in the bronchial tubes and trachea of *Strongylus micrurus* (*Dictyocaulus viviparus*), rarely the *Strongylus pulmonaris*. It is extremely common in this country towards the end of summer and during autumn in

animals grazing on certain lands. The earliest methods of treatment consisted in giving agents by the mouth similar to those advised for gastro-intestinal strongylosis, such as oil of turpentine, creosote, asafœtida. It must be remembered that many cases of verminous bronchitis are complicated with the gastro-enteritis caused by the strongylidæ of the alimentary canal; indeed, in some outbreaks I have met with the latter was responsible for a large proportion of the losses. On that account the agents given by the mouth are useful to deal with complications and to some extent may destroy the larvæ of the bronchial strongyles taken in with the food. Oil of turpentine and other drugs are excreted by the lungs, but in too small a proportion to exert a vermicidal action upon the nematodes of the bronchial tubes. The administration of drugs, such as sulphuric ether and oil of turpentine, by the nostrils, does not appear to me to be justified by the results; the effects are similar to those produced by drenching, and the method of administration is objectionable. Fumigations were later introduced to combat the disease. The various materials used for the purpose included burning tar, rags, feathers, horsehair, sulphur, chlorine, and iodine. In some districts sulphur dioxide and iodine are still used apparently to the satisfaction of the owner. For sulphur dioxide fumigations the calves are turned into a house in which all the openings are carefully stopped up, and sulphur burned on the floor until the operator can stand the fumes no longer. Then the burning of sulphur is stopped, and the calves kept in for half an hour or until the calves begin to show symptoms of dyspnœa. This is carried out on several occasions at intervals of one or two days. This method is not free from danger to the patient. With iodine inhalations each animal is treated separately. A small quantity of iodine is placed on a hot brick in a bucket enclosed in a sack, and the head of the calf covered with the latter. The inhalation is continued till the animal becomes affected with a fit of coughing. The most popular form of treatment at present in vogue is that introduced by Levi, of Pisa, and consists in the intratracheal injection of anthelmintics mixed with glycerine, oil, or water. By this means

the vermicides are brought into direct contact with the worms and embryos. Common mixtures are (1) Carbolic acid, 10 minims; chloroform, ½ dr.; ol. tereb., glycerine, āā 1 dr.; (2) olive oil, 10 parts; ol. tereb., 100 parts; carbolic acid, 2 parts. One dose is 2½ dr. The material is given by intratracheal injection every second or third day on two or three occasions. For the injection a strong syringe and needle are required. The skin over the trachea is best incised with a knife, and the needle inserted between the two tracheal rings in the direction of the chest. The material is injected slowly into the trachea, the head of the animal being kept elevated during the process to prevent the fluid flowing into the larynx. The agents used appear to act only upon the worms and embryos in the trachea and upper portions of the bronchial tubes. On one occasion I gave an intratracheal injection of one of the above mixtures to a calf evidently in a moribund condition. Two days afterwards it died. At the *post-mortem* examination the bronchial tubes were crammed full of living strongyles and their embryos, and there were also numerous strongyles in the trachea. Liquids injected into the trachea are rapidly absorbed, oil emulsions less rapidly than watery solutions, but they do not mix so readily with the mucus which surrounds the worms. Hence the treatment requires to be repeated. Calves in a weak condition occasionally collapse after the injection, and when pneumonia sets in from the irritation of the embryos and the inoculation of bacteria the injections are of no service. In those cases which recover on account of some strongyles being left the animal continues to cough for a time after treatment. In order to ensure that the anthelmintic mixture injected may reach the smallest bronchial tube and may thus come in contact with the worms and their embryos, Scheibel has introduced a spraying apparatus instead of a syringe. He employs first a special curved trocar and cannula, which he inserts into the trachea in the direction of the thorax. To the end of the cannula are attached two rings, by which it is kept in position during treatment by means of tape tied round the neck. After the trocar is removed the stem of a **V**-shaped spraying tube is

inserted into the cannula. To the branches of the tube are attached india-rubber tubes, one in connection with the bellows for blowing in air, the other attached to the vessel containing the vermicide mixture. The mixture he uses consists of ℞ creosote, 1 part; rectified spirit and water āā, 50 parts; dose, 2½ to 5 dr. During the spraying process the vessel is held lower than the cannula, so as to prevent the fluid flowing into the trachea. A pause is made when a fit of coughing sets in. The spraying is carried out daily for three days with invariably successful results. The method deserves a trial in this country. Intratracheal injections are not indicated when marked symptoms of pneumonia set in. The symptoms of the disease disappear with the onset of frost. As in all worm infections, a generous diet is of as great importance as the medicinal agents. In one outbreak in 1908 thirteen calves were affected; three died before treatment. I housed one of the most advanced cases, gave it no medicine, but allowed it 1 lb. of linseed cake per day in addition to other food; the others were allowed out, and were given intratracheal injections. All the animals recovered, and the untreated calf did as well as the others. It may be said, of course, that it was protected from further infection by being housed.

Among young sheep from three to nine months old a similar condition is set up by *Strongylus filaria* (*Dictyocaulus filaria*). This affection is treated in the same way as in cattle, but the doses employed are half to a quarter less. Zieman recommends as an intratracheal injection a mixture consisting of equal parts of a solution of iodine (iodine, 2 parts; potassium iodide, 10 parts; water, 100 parts), and oil of turpentine and olive oil to make an emulsion. The dose is 75 to 120 minims, and administered every other day on two or three occasions. It is difficult to apply the treatment to a large flock.

Lung lesions in the sheep, occasionally in the goat, are produced by the *Strongylus rufescens* (*Synthetocaulus rufescens*) and *S. capillaris* (*Synthetocaulus capillaris*). In this country very few sheep are free from small dark nodules in the lungs due to one of these nematode parasites. Occasionally small patches

of broncho-pneumonia are set up by the *S. capillaris*, but they do not appear to cause any serious disturbance. Very occasionally an acute pneumonia is set up, probably as the result of a bacterial complication. The infection in this case may be carried by the hay in animals which are housed. Intratracheal injections or fumigations can have no effect upon these diseases. Good feeding and stomachics, such as salt and sulphate of iron, are all that can be recommended. In young pigs in which a verminous bronchitis is set up by *S. paradoxus* (*Metastrongylus apri* and *M. brevivaginatus*) intratracheal injections are hardly admissible. Various mixtures containing asafœtida are often given, but prophylactic measures are of the greatest importance, consisting of the destruction of the affected animals and the disinfection of the discharges and the pig-styes. The disease may cause no serious trouble. In cats, lesions in the lungs similar to those produced by the *S. rufescens* in sheep have been occasionally produced by *S. pusillus* (*Synthetocaulus abstrusus*). Intratracheal injections have been suggested, but are not likely to be of much service. In many species of birds a verminous tracheo-bronchitis is set up by the *Syngamus trachealis*. Great mortality often results in chickens before they have got their feathers. One method of treatment consists in inserting a feather (from which the barbs have been removed save at the tip), through the mouth into the trachea, twisting it round, and pulling it out. Some of the worms may be removed from the upper portion of the trachea, especially if the tip of the feather is first dipped in oil of turpentine. This method is inadmissble with very small birds on account of the small size of the trachea. Good results have been obtained by intratracheal injections of a 5 per cent. solution of sodium salicylate. 1 c.c. (15 minims) is introduced with a syringe either through the mouth or by a bent needle pushed through the skin into the trachea. The worms drop off the mucous membrane after the injection, and are expelled by violent attacks of coughing. Fumigation with sulphur dioxide or tobacco smoke is not so useful. To prevent reinfection, 1 per cent. salicylic acid is added to the drinking water, the

sick birds separated, and the runs, coops, etc., carefully disinfected by 1 per cent. salicylic acid or sulphuric acid, and the ground turned over.

NEMATODES OF THE CIRCULATORY SYSTEM.—I have already referred to the *Strongylus vulgaris* in the equines. Filariæ appear in various parts of the circulation of the horse, ox, and dog. The treatment of these conditions is symptomatic and unsatisfactory. Pease observed considerable improvement in horses affected with *Filariæ sanguinis equi* in India from the use of cacodylate of sodium. Perhaps this drug or similar agents, such as atoxyl, might be of service in the conditions due to *Filaria immitis* and *Strongylus vasorum* (*Hæmonstrongylus vasorum*) in the dog. In Egypt, Mason found no medicinal treatment of service in dealing with disease due to filariæ in the blood of camels.

NEMATODES IN OTHER SITUATIONS.—The worms in the connective tissues are no more effectively dealt with by drugs than those in the blood. The tumors caused by *Onchocerca reticulata* in the tendons of horses can be removed only by excision, but Pader and Druin consider antiphlogistic treatment best. The tumors may disappear spontaneously. This also obtains with the periodic patches of hæmorrhage on the skin seen in Hungarian, Russian, and Tartary horses due to *Filaria hæmorrhagica*. If the affected areas are kept clean and undisturbed the disease spontaneously disappears. "Summer sores" in equines caused by the *Filaria irritans* are best treated by complete excision of the granulations, and the application to the wound of strong antiseptics, such as 30 per cent. copper sulphate solution, an alcoholic saturated solution of picric acid, a 10 per cent. to 20 per cent. alcoholic solution of salicylate acid. Rey recommends the application of arsenic sulphide. A dry scab about ½ in. thick forms, which falls off after eight to ten days, and healing soon occurs. No satisfactory treatment is applied to the worm nodules caused by the *Onchocerca gibsoni* in cattle. The treatment for *Filaria oculi* in the horse and *Filaria medinensis* in man and animals is purely surgical.

In cattle and other animals, conjunctivitis set up by varieties

of thelaziæ are successfully treated by first cocainizing the eye and removing the thelazia with forceps or by instilling 1 per cent. creolin or corrosive sublimate 1-2000 into the conjunctival sac daily for some days to get rid of the parasite. One also may have recourse to prolonged irrigation to expel the worms. If the presence of *Eustrongylus gigas* in the kidneys or other organs is ever diagnosed its removal will be purely surgical; no drugs are likely to act upon it.

IMPORTANT—THE NEW NATIONAL ANTI-NARCOTIC LAW.

The new Federal Anti-narcotic Law goes into effect on March 1, 1915, and under this law every veterinarian is required to take out a narcotic license from the national government; this license will cost $1 per annum. He is also required to use official blanks, supplied by the Government, in ordering his supplies of opium, morphine, codeine, heroin, cocaine and the various mixtures, compounds and derivatives of opium and coca leaves. These blanks will probably cost $1 per hundred. No retail dealer, jobber or manufacturer will be permitted to supply any of these drugs to any physician or veterinarian unless such an official blank is used in making the order.

The veterinarian is also required to keep records of drugs dispensed, *providing he is not in actual attendance upon the patient requiring them.* No record is required of drugs which he personally dispenses to a patient. Perfect freedom in dispensing his own drugs is in no wise interfered with.

The veterinarian who has not secured his license promptly by March 1 will suffer much inconvenience, since he can neither buy any of these narcotic drugs nor prescribe them without it. The pharmacist will not be permitted to fill any prescriptions calling for narcotics signed by *unregistered* veterinarians.

The license and order-blanks can be procured only from the COLLECTOR OF INTERNAL REVENUE in the district in which the veterinarian lives, and all veterinarians are urged to write at once to their local Collector, asking for proper application blanks in order that they may secure their license and order-blanks in ample time, and avoid the embarrassment that will confront them on March 1st if not prepared.

AUTOLACTOTHERAPY.*

A New System of Therapeutics.

By Charles H. Duncan, M.D., New York, N. Y.

The mortality among nursing infants during the summer months is generally considered from two aspects, namely, preventive and therapeutic. An incomparably better method of treatment than those previously employed, is the unmodified antitoxin treatment previously advocated by me.

In the present paper I will take up this new method of combating infectious disease with unmodified antitoxins or with substances antidotal to the action of all of the toxins pathogenically active in the patient's body. This method I call *autolactotherapy,* or unmodified antitoxin therapy.

That innumerable pathogenic micro-organisms enter the body daily is well known. Myriads enter with the inspired air. They are taken into the system in massive doses, at every meal and in other ways. Many of these are constantly being destroyed by the protective agencies or fluids of the body. During their destruction their toxins go into solution by autolysis. In response to the action of these toxins the healthy tissues produce protective agents—the antitoxins. These are found in the various fluids of the body, as the milk, blood, etc. The process of producing antitoxins in the body is continually going on, as the supply of micro-organisms is continuous and varied. For the same reason the lower animals also produce antitoxins in their blood, milk, etc. Beside the antitoxins continually produced in our bodies in response to the micro-organisms entering it, we take into the body the antitoxins produced in the animal, by eating the meat and drinking the milk of the animals. It is probable that many of the antitoxins in the meat are destroyed by heat. As the

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result of many tests made by me in autotherapy, I hold that the mouth is the natural channel through which live micro-organisms pass into the healthy tissues and there safely establish immunity. The opsonic index is quickly raised when many varieties of live pathogenic micro-organisms are taken into the comparatively healthy tissues through the mouth, *i. e.,* the staphylococcus, streptococcus, colon bacillus, etc. This has been abundantly proved daily in the clinic by many thousands of tests by myself and hundreds of other physicians. I was the first successfully to employ the live pathogenic micro-organism as a therapeutic agent.

By taking into the mouth the unmodified antitoxins produced by the animal, we acquire passive immunity. This in the past has been done in a haphazard manner during the regular process of taking nutrition. It is the object of this paper to show how this haphazard process may be controlled in a measure, *i. e.,* placed on a scientific basis and utilized in a very simple manner both in prophylaxis and in the cure of disease.

Experimentally it has been shown by MacClintock and others, that a guinea-pig will absorb *in an empty stomach, in one hour, sufficient antitoxins to protect it against five lethal doses of the corresponding toxin.* It is well known that the antitoxin of the toxin of a given pathogenic micro-organism will cure more cases of the corresponding disease than a toxin or vaccine of that micro-organism will cure. That is to say, the antitoxin does not have to be so individualized to act therapeutically as does the toxin. The antitoxin tends to be curative in practically every patient having the corresponding disease. It is more general in its application as a therapeutic agent than the toxin or vaccine. To be most curative, the toxin or vaccine must be taken from the individual patient's body. The range of cure of the toxin, therefore, is narrowed down to the individual from whom it was taken, unless it cures by accident.

Milk is the food that has ever been held in the highest esteem by all civilized people in all ages for the convalescent, the invalid, and the very young. For these it stands alone, the food supreme.

It is seldom contraindicated and is usually borne well, by even a weakened stomach. It is the natural food the mother supplies to her offspring. But as Nature seldom does things by halves, we find that it has another important function that may be utilized, that of transmitting the immunity of the mother to the child. Understanding in a measure how this is done, as the result of many clinical tests on human subjects, I take advantage of the principle that underlies the immunization of the young through milk, and employ it in immunizing both the mature and young (*American Practitioner,* October 1, 1913).

It has been beautifully designed by provident Nature, that the psychic affection and love manifested by the mother in nursing her baby, physically transmits through her milk to the child, substances that protect it against bacterial invasion. The human mother does not always as effectually protect her offspring against bacterial infection by the antibodies contained in her milk as do the mothers of the lower animals. The reasons for this will be pointed out later. It is then clearly the duty of the physician to enter on the scene of the life struggles of the infant and make up the deficiency, where possible, by adding those protective agencies, *the unmodified antitoxins,* to the human mother's milk in which it is deficient. One method of doing this is illustrated in the following test:

Case I. Patient, female, nursing baby aged ten months, was presented for treatment, suffering with a severe bronchitis. There seemed also to be present an associated rhinitis, for mucus flowed quite freely from the nose. The condition had persisted for about ten days. As to treatment, the mother was instructed to collect during the morning upon small pledgets of cotton as much as possible of the mucous flow from the nose and to place these in a bottle and bring them to the office. There were about twenty pieces in an ounce bottle. The bottle was filled with water and allowed to stand for twenty-four hours with occasional agitation, after which time the contents were expressed and passed through a Berkefeld filter. Two c.c. of the bacteria-free filtrate was then injected subcutaneously into the mother and a dram was given

to her by mouth. The mother said she had a slight headache the next day, and was somewhat feverish. The cutaneous reaction was about the size of the palm of the hand. Forty-eight hours after the injection, however, the baby was distinctly better and progressively recovered without any other medication. This test has been repeated successfully several times.

The baby received the unmodified antitoxins to its own toxins developed in the mother and passed to the child through the mother's milk. It is well known that the very young can present but little resistance to an invasion of pathogenic micro-organisms. Nature designed that the mother should acquire resistance to infections for it. In the light of autotherapy, this cure is plain when we recall a common every-day occurrence, and perceive it in the light of scientific reasoning. In the lower animal families, as in the cat and dog species, the mother constantly licks any and all of the discharges that adhere to the orifices of her young. She seems constantly to be employed in this loving, watchful care, and in the colitides, bronchitides, sore eyes, etc., that often appear in the very young, she, by this practice, quickly elaborates in her body antitoxins to the toxins of the micro-organisms pathogenically active in her offspring. These antitoxins transmitted, not only cure the one infected, but immunize all of the rest against the bacterial infection in question. Following out this line of thought, we are forced to conclude that since the antitoxins of commerce are developed in animals in response to the injection of filtered toxins, if a cow, she goat, or other female lactating animal, is injected with filtered toxins from which a given patient suffers (*e. g.*, bronchitis, enterocolitis, purulent infections, etc.), the injected animal should acquire antitoxins to all of the toxins present in the patient. The patient drinking the milk of such an immunized animal, would thus receive substances antidotal to all of the toxins active in his body, and this, too, without extra tax upon his strength or danger of calling forth anaphylaxis. The patient is thus cured in the quickest and easiest manner possible, for there would be no systemic disturbances, such as rise in temperature, chill, headache, fever, etc. Every one may have an

animal to withstand the strain incident to the development of substances directly antagonistic to the disease or antidotal to the toxins in a given case. In fact, several of my patients have lactating goats for this purpose. They are as conscientious almost in looking after the goats' interests, in buying a daily supply of beets, cabbage, etc., as for one of the family.

All that is necessary to do, is to filter the exudate from the patient's body and inject the bacteria-free filtrate subcutaneously into the animal. In many instances he may simply give the exudate to the animal by mouth. After developing active immunity in the animal, the animal's milk is given to the patient to drink when nourishment is required. In this way the patient takes the unmodified antibodies into the empty stomach where, as previously stated, it has been found that they are readily taken up by the tissues, thus rendering the patient able to resist the action of the toxins active in his body. A healthy lactating woman would be ideal for this purpose, for then we should have the ideal substance for combating disease—the human antitoxins. But the danger of infection from a woman, who previously may have contracted some disease, might be a factor that would militate against the general adoption of this agency. Also the blood of the animal bearing the burden of the disease may be used to convey the antitoxins from the animal to the patient.

It is but a very short step from the animal mother in the care of her young, to the human mother in the care of her young. The remarkable feature is that there are few mothers who would not as a last resort cure their babies, no matter what the cost might be to preconceived ideas. One said she would gladly do it if necessary, that there was nothing about her baby that was abhorrent or revolting to her. It was part of her body; it came from her body, she nourished it with her body, why should she not save its life in the same way? The mother will rarely be called upon to lick the moist gangrene from the umbilical stump, or the palatal ulcerations of the new-born, or taste the pathogenic discharge from the colon, or the mucus from the nose, or pus from the eyes, for the physician is usually at hand to administer

the more elegant preparation in the manner suggested. The life of an heir means much at times, both to the present generation and to posterity; it always means much to the mother. In such cases, no power within the scope of human endeavor would be overlooked to save the life of the offspring; anything that would do this would be frantically welcomed. To be sure, other means often cure these conditions, but the method here presented appears to be a very certain cure in many maladies, if the treatment is not too long withheld.

Enough has been said to indicate that no mother would hesitate to take the discharges if she was convinced that it would save the life of her baby. Would the physician hesitate to give effective medication simply because it was not esthetic or palatable? The case may be urgent and time an all important factor. The physician may not have the Duncan autotherapeutic apparatus and it would take too long to obtain one. From a therapeutic point of view the method of licking the discharge is the natural method bequeathed by old Dame Nature for the protection of the life of the young by its own mother, its natural protector, its life giver, now its life saver. Oh! the beauty and completeness of Nature and her ways.

The next case was in a very poor family:

Case II. Patient, male, nursing baby two weeks old. The delivery was normal, and everything progressed apparently satisfactorily. The writer was called. He found an extensive excoriation of the gluteal region around the anus. Both folds were inflamed, very red, with much induration. He prescribed the usual remedies for this condition and left word to be called if there was no improvement. Two weeks later, he was again called. At this time he found the inflammation had apparently extended over the whole body in the form of small pustules. There were many on the head, back, and body. On the following day the mother had a large boil on the *mons veneris*, showing she, too, had a lowered index to the infecting pyogenic micro-organisms. On the following day the boil was opened and a dram of pus

liberated. Microscopically, this was diagnosed to be streptococcus, short chains, pneumococcus moderate, occasional bacilli.

She was given five drops of this, mixed with an ounce of water by mouth, in three divided doses, an hour apart. Within twenty-four hours a distinct change came over both mother and child. The mother had no pain and was comfortable. In forty-eight hours, the pus had dried up, leaving only some redness to mark the site of the furuncle. The baby went quickly on to recovery. Its temperature became normal, the pustules dried up, it stopped crying. Four days afterward, the child was apparently well, with smooth soft, healthy baby skin.

The unmodified antitoxins developed in the mother passing to the child through the mother's milk are the main factor upon which the resistance of the child to bacterial infection depends. This, then, is one of the reasons why a bottle fed infant is more prone to bacterial infections than a breast fed infant. The bottle fed infant acquires immunity to the micro-organisms to which the healthy cow is exposed. It is possible that the cow under normal conditions does not take the micro-organisms to which the infant is commonly exposed, in sufficiently large amounts from her food, as grass, hay, etc., as to cause a very great amount of acquired immunity in the human patient drinking her milk. If the cow is systematically immunized with the unmodified toxins of the pathogenic micro-organisms that infect a given patient in sufficient amounts, she will produce a relatively large amount of antibodies to the injected toxins respectively, an amount sufficient to give passive immunity to the corresponding micro-organisms to the human being drinking her milk. For it must be remembered that the nursing infant or invalid would take the antitoxins in the milk, on an empty stomach, in comparatively large amounts and that continuously. This method of treating patients appears to be far reaching, and its importance is hard to estimate at the present time.

For many years the writer has never given a nursing baby a cathartic or laxative. He gives it to the mother, and the results are positive and apparently better than when given to the child.

Calomel given to the mother is especially effective in moving the baby's bowels. In view of this fact, I ask myself the question: "Is it not possible that some of the intestinal disturbances in bottle fed babies are due to intestinal disturbances of the cow manifested by her loose stools, caused by the food she eats, some particular kind of plant or grass or weed, that acts on her bowels as a cathartic?" If intestinal disturbances of the bottle fed infant are due to infecting micro-organisms, or to dysentery in the cow, what becomes of the highly complex formulas or percentages for infant feeding worked out for these cases? It appears that percentages of infant feeding in these specific cases should be employed simply as adjuvants. It seems that if more attention was given to the feeding of cows there would be less intestinal disturbance during the summer in bottle fed infants. It appears also that if the cows were immunized to the micro-organisms that commonly infect the bottle fed infant, there would be even fewer disturbances of this kind.

It is well known that strong mental impressions of the mother often affect the nursing infant seriously, through the toxins so generated in her body, being transmitted to the child through her milk. Carpenter's *Physiology* mentions several cases where death occurred in the nursing infant by the transmission of toxic substances that were generated in the mother by a strong mental impression, to the child through the mother's milk.

CASE III. During the early spring of 1914, Professor William H. Dieffenbach, of New York, was severely poisoned with poison ivy while working on his farm. His ears swelled to three times their natural size. His face and arms were covered with blisters. He became so acutely sensitive to the poison that he would have another attack by even riding through the country in his automobile. He has had six distinct attacks during the spring and summer. In fact he could not go into the country without having an attack. He tried over thirty different remedies without effecting a cure. Having read a paper by me on the subject of unmodified antitoxin therapy or autolactotherapy, he decided to test it on himself as a patient. Accordingly he

had his hired man give one of his cows the leaves of the poison ivy for several days. He then drank about a quart of this cow's milk. In a few hours, the stinging, biting sensation became less, and the painful itching gradually subsided. He improved and made an uneventful recovery. He has been up to the farm several times since with no sign of recurrence. The cow apparently thrived on the leaves.

In view of the extreme sensitiveness or low resistance Professor Dieffenbach manifested to the toxic principal of poison ivy, and the quick response he made to the antisubstances in the milk, I ask myself the question: Would several patients whom I have formerly treated with the filtered toxins from their own infecting micro-organisms, and who had extremely low resistance to them, have been benefited by the antitoxins of these toxins that were generated in an animal and transmitted to the patient through the milk? The affirmative answer, it appears, we are bound to give, opens up therapeutic possibilities that are endless. The writer has never seen any appreciable systemic disturbance following the use of unmodified antitoxins.

CASE IV. Patient, female, aged thirty-nine years, had been suffering with a cough for five years, following pneumonia. Eighteen months ago it was diagnosed as pulmonary tuberculosis. When first seen by the writer during the early part of July, 1914, she was in a rapidly advancing stage of the disease. The upper lobe of both lungs and the lower lobe of the right lung were involved. She coughed the greater part of the night and raised much mucus. She had night sweats and lost considerable weight, her present weight being eighty-three pounds. Evening temperature 100 degrees F. plus, with morning remissions. It was decided to treat the patient by autolactotherapy. Accordingly on Wednesday, June 29, 1914, a healthy lactating goat was injected with one c.c. of the filtrate of her sputum prepared in the usual manner, and the following day she began to take the animal's morning milk. On the following Sunday night, to use her own expression, "I slept like a baby the whole night through. I did not cough once during the night and had no night sweats." This

patient is improving in every way. It is too early to offer a favorable prognosis, but it is certain that here is a case of advanced pulmonary tuberculosis that is apparently improving by a new method of treatment.

It seems as if large firms making a business of supplying milk for infant feeding, could add immunizing qualities to the milk without in any way interfering with the percentages of the composition of the milk. They could possibly supply the antitoxins in the milk that would tend to combat or antidote the pathogenic micro-organisms or the etiological factors of some forms of dysenteries, diarrhœas, bronchitides, etc. They could place a certain number of cows aside to produce milk that would combat infections caused by the staphylococcus, streptococcus, colon bacillus, etc., and use this milk for infant feeding, both as a prophylactic and therapeutic agent. At my suggestion, one large milk laboratory is making tests along this line this summer.

Let us assume for the sake of discussion that an epidemic of typhoid fever breaks out in a community. If this treatment is effective in typhoid fever, the authorities will see that the community is immediately supplied with antityphoid fever milk, or milk from cows that have been immunized with the toxins of typhoid fever. The patient will purchase, or be supplied by the department of health with antityphoid fever milk. Thus the whole community will be quickly and safely immunized to typhoid fever by employing the most common necessary article of food, and that without any danger. Carrying this conception still farther, we might possibly anticipate or antedate an outbreak of an epidemic by supplying antidotal milk before the time statistics indicate that it is liable to occur. We now largely control the conditions under which the supply of milk is obtained and its passage to the consumer.

It would take a somewhat more rigorous regulation of milk, to be sure, but this is not a problem that could not be worked out scientifically and comparatively economically. This is the age of preventive medicine.

The physician, knowing that a woman who is about to be

confined will be exposed to infection, could, after taking the usual aseptic precautions, place her on antipyogenic and antitetanic milk, both before and after parturition. By so doing he could be reasonably certain that infection would not take place, even though his aseptic surgical technic was faulty. He would be even more certain that infection would not take place if he employed autotherapy of labor at the same time (Autotherapy in Gynecology and Obstetrics, *Medical Times,* May, 1914).

The following case illustrates my combined unmodified toxin and unmodified antitoxin method of treatment as a prophylactic to purulent infection. Let us assume, for the sake of bringing out the various phases of the discussion clearly, that an important man of the nation sustains a compound fracture of both bones of the leg with extensive lacerations. His leg and life must be saved if possible.

The writer believes that the following treatment would prevent infection almost every time. Either one of these alone would probably be effective, if the treatment is properly carried out: Beginning on the day of the accident, the patient is instructed to lick the wound thoroughly once daily or oftener. When this is done, the wound will heal without the evidences of infection. However, the patient may not be able to get the wound to his mouth, or he may object to this method of treatment on the ground that it is not appetizing or esthetic. Then in treating the patient autotherapeutically, the physician has the choice of two other methods of treatment. He may then either give the patient one half of the discharge from the wound daily by mouth without his knowledge, at both morning and evening dressings, or the discharge from the wound may be passed through a Berkefeld filter and the bacteria free filtrate injected hypodermically in proper doses daily, according to the technic given in my previous papers on the subject (*Practitioner,* April, 1914).

One half of the discharge is employed to immunize a goat or other lactating animal. On the day following the injection of the animal, the patient is given the goat's milk to drink when nourishment is required. By employing the discharge from both

morning and evening dressings, we should be certain of obtaining the micro-organisms as early as possible. The patient treated by this method would be acquiring active immunity to his infecting micro-organisms or autoimmunity, while the animal would be acquiring immunity to the micro-organisms pathogenically active in the patient at the same time. The patient would thus receive nourishment, and at the same time be taking antitoxins specific to all of his infecting micro-organisms.

If the wound is clean, this treatment will do no harm.

The regular preparation of a patient for an operation usually includes a diet of milk, both before and after the operation. There appears to be no reason why this milk should not be antipyogenic milk, or milk containing substances antidotal to pus formation, or antagonistic to pyogenic infection that at times follow an operation.

We may be able to abort some operations by having the patient drink antipyogenic milk, or milk from cows that have been immunized to the common pus producing micro-organisms. This is an exceedingly quick method of immunization. It lends itself readily to many conditions. In a few hours we may be immune to one of many infections. It is the least harmful method of immunization. In fact the patient need not know that he is taking a remedy or is being immunized. It taxes the system less than any other method, making it a boon to the very weak and enfeebled and the very young. It interferes with no established method of treatment, but offers an additional element of safety when the treatment is properly carried out; there is no anaphylaxis, no serum sickness, no tax on the heart. The advantages of my unmodified antitoxin method of treatment are many and will readily suggest themselves to the reader familiar with the subject of immunity.

It is well known that the very young have little power of reaction to toxins of pathogenic micro-organisms, and for this reason we should not attempt to produce active immunity by giving children medication that depends on reaction for a cure, but we should immunize the mother, if possible, when it becomes

necessary to immunize the nursing baby, for she is usually stronger and better able to withstand the strain incident to the development of antibodies that are the result of the reaction. When we immunize the mother to the micro-organisms pathogenically active in the child, there are developed in the mother *antibodies specific to all of the micro-organisms that infect the child, both causative and complicating,* hence the cure is quicker and more complete than it would be, had the mother or child been immunized in any other way. A diagnosis is often unnecessary as far as a cure is concerned when this method of treatment is employed. It is a simple office or bedside procedure.

The mother who does not nurse her baby robs it of the protective agencies against infection that belong to it by inheritance, that are bequeathed to it by Nature. Heretofore we have been immunizing against the more or less rare infections and have practically overlooked or neglected to immunize as a prophylactic against the most common pathogenic micro-organisms with which we have to deal, *i. e.,* the staphylococcus and streptococcus. There appears to be no good reason why we should not immunize against these as well, and many good sound reasons why we should immunize our patients against these at stated intervals. These cocci are the etiological factors or predisposing cause of more diseases than all of the other pathogenic micro-organisms put together. The advantages of immunizing against these micro-organisms are apparent when we understand that "they are found," as Mittman says, "in seventy cutaneous diseases." They also cause or complicate nearly every form of respiratory infection, as bronchitis, tonsilitis, sinus involvement, rhinitis, pharyngitis, laryngitis, pneumonia, pulmonary tuberculosis, also boils, abscesses, furuncles, rheumatism, appendicitis, cholecystitis, endometritis, salpingitis, etc., and there are many other diseases caused by them. There are many other diseases in which these micro-organisms act as complicating factors. Being immune to these cocci, it is probable that these infections would not be as severe as they would be had the patient not been immunized. If we include a very few other pathogenic micro-organisms, against which we

would periodically immunize our patients by giving them the unmodified antitoxins contained in milk from an animal immunized to these micro-organisms, we should probably be able to abort or keep our patients free from a vast number of the most common infections to which human flesh is heir and prolong human life. Some physicians may prefer actively to immunize their patients to these cocci. It then remains a matter of choice, but the writer prefers the passive immunization in the manner suggested.

During the summer months when colitides, dysenteries, etc., are common in nursing infants, if we immunized the mother as a prophylactic to infections common in the nursing infant, as the staphylococcic, streptococcic, colon bacillary, etc., it is probable that a great many summer complaints common in the young would not occur and the mother herself would be immune to many of the diseases mentioned above, and therefore would give a better quality and quantity of milk. The question arises: What is the distinctive field of medicine autolactotherapy and autotherapy are destined to occupy?

In all infectious diseases the improved condition of the body depends on the antitoxins. The antitoxin is developed in the living animal tissues in response to the action of a toxin on these tissues. The antitoxin is the result of the reaction of the tissues to these actions of the toxin. Not every person suffering with a toxic disease dies. The antitoxin is the substance the tissues produce to neutralize or antidote the action of toxins, and hence to cure the disease. The antitoxin that is developed in an animal immunized to the toxin that is pathogenically active in a given patient's body, is effective, if given to that patient. If there is more than one active toxin in a patient at the same time, immunity acquired by its use is of shorter duration.

The antitoxin that is previously produced in an animal, is quicker in its action than the antitoxin the patient would be compelled to produce by the action of his toxins on his body tissues. But the immunity acquired by the use of the heterogenous antitoxin is of shorter duration.

There is little or no systemic disturbance in the patient after

taking the antitoxins contained in the milk of an immune animal. There is always a local reaction after giving my unmodified toxin complex hypodermically, and if the dose is sufficiently large, a systemic reaction also follows its use. The range of effective doses of the unmodified toxin complex is so very great, however, that if it is given with a skilled appreciation of the nature of the infection and the response of the individual, the dose can usually be fairly accurately gauged and readily modified by experiment so that there will be no appreciable systemic disturbance of any kind. There must always be some reaction, else no antitoxins will be developed. This reaction, however slight, might be a factor that would militate against its use in patients of very low vitality or reactive power. The antitoxin, therefore, may be given in preference to the toxin to those patients who have little power of reaction, namely, the very young and the very old, and to patients with little vitality, or slight reactive forces. This latter class of patients are often found among those suffering with chronic diseases. By this it is not to be inferred that the unmodified antitoxin therapy is not applicable to acute infectious diseases, for it appears that it is. The acute onset of some infectious diseases is so rapid, however, that we may not always be able to employ autolactotherapy as soon as desired, unless a lactating animal is always at hand ready for use. For this reason I believe it will be used more frequently in chronic diseases.

On the other hand, autotherapy is especially applicable in all acute localized infectious diseases, curing them or aborting them quickly, often within twenty-four hours, if given sufficiently early. It is often equally effective in chronic diseases. If acute diseases are aborted or cured, there will be no chronic diseases for autolactotherapy to cure. I believe that a judicious combination of both autotherapy and autolactotherapy constitutes the most rational treatment of localized and possibly non-localized infectious diseases.

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GIVE THE HORSE A SHOW—

Do you ever get to thinking of the way we used to go?
We could drive as fast as blazes or we could travel slow;
We could let the reins lie loosely or hold them fast and taut,
The horse would prance or amble, on journey long or short.
We could pull old Dobbin's foretop, and smooth his velvet nose,
We could dress him up in harness when we wore our "Sunday clothes"—
And we could go a-riding along the country lanes,
There wasn't any danger. Just hang on to your reins!
There were no horns "a-tooting," or engines 'long our path,
A-racing like a comet, with death for aftermath.
I tell you it was better when we used to take the road
With Bill, or Nell, or Dobbin—they didn't mind the load.
We used to have some snow-storms; when the tracks were cleared for sport
We'd hitch up Ned or Billy and the longest night seemed short.
The old-time fun is ended—the times we used to know
Just melted, gone like snow-drifts—
They don't give the horse a show.

We travel now with engines—we make an awful noise—
Everyone is speeding and everyone lacks poise;
But I shall keep old Dobbin—think of days I used to know—
And I sha'n't buy an Auto till they give the Horse a show.
—(Written for *The Horse Lover* by Mattie E. Dodge-Gammons).

MASTITIS.*

By Chas. E. Cotton, Minneapolis, Minn.

When the secretary appealed to me for a contribution to the program of this meeting, I hesitated for the reason that it is impossible for a busy practitioner to offer anything original or new to the knowledge of his profession, except perhaps some unusual case report.

I have chosen the subject of mastitis because for years I have realized how little we know of this affection and its successful treatment. It is one of the most serious affections to the dairy industry and it is our duty to continue to endeavor to find some more effective method of treating or combating it when it appears in a dairy herd.

I wish to state at this time that there is nothing original in this paper. It is simply a compilation obtained from my study of the disease and the most part of it is from the lectures I received from Dr. L. Klein of Philadelphia, last winter.

This disease is the result of an infection of the milk gland, due to the entrance of the micro-organisms which produce any ordinary wound infection. Investigators have found all of the types of organisms which are recognizable in wound infection, such as streptococci, staphylococci and colon bacilli.

The inflammation of the mammary glands may be divided into two groups—one in which the infection gains entrance into the cavity of the milk gland from the exterior through the teat canal or through some wound of the skin of teats or udder. The other in which the infection reaches the tissues of the gland through the medium of the blood stream, as in tuberculosis. The infection of the ray fungus is unknown as to origin, is hard to diagnose at first and is characterized by many tiny abscesses.

Klein divides mastitis into three types, depending upon the

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tissue or part of udder inflamed: interstitial, which affects the loose connective tissue binding together the tubules and extending up into the gland tissue; catarrhal, which affects the mucous membrane inside the teats and the large milk ducts; parenchymatous mastitis, which is an inflammation of the epithelial or gland tissue proper. I shall take up the subjects separately, first undertaking to cover the interstitial form, then the catarrhal and last the parenchymatous.

A simple non-infectious inflammation or mastitis may come from traumatism or injuries. As a result of the injury we have an infiltration of serum and leukocytes. The tissues become swollen, tender and hot. The more serious interstitial inflammation results from the entrance of bacteria into wounds or cracks in teats, producing a phlegmon or suppuration in neck of teat, viz., exudation of serum into the connective tissue, the leukocytes wander in and a few red blood cells, then the serum becomes blood stained or it may have the appearance of serum mixed with pus. This process produces no change in the milk, but if the inflammation extends into the gland tissue the milk is changed and takes on the appearance of whey, a turbid fluid with clots floating in it. The teat becomes swollen, hot, tender and œdematous and at the height of the inflammation the bodily temperature rises as high as 107 degrees F., the animal is depressed, dull and stops eating.

The treatment of these two forms will vary. The simple non-infectious interstitial mastitis is treated like any other simple inflammation. In the first twenty-four hours cold is necessary to keep down swelling and exudation. After this, warmth and moisture is indicated, viz., bathing with hot water and at night applying a Priessnitz dressing, made by applying a layer of moist cotton or oakum next to skin, over this a layer of woolen material, over this a layer of oiled paper or rubber and over this ordinary bandaging material to cover. You have here everything that poulticing or antiphlogistine will do. It is well also to rub affected part with some astringent solution; use white lotion diluted one-half, lead water and laudanum, or best of all, Bor-

row's solution (lead acetate 6 drams, alum 1 oz., spirits of camphor 2 oz., water Q. S. 1 pint). On the teats which you cannot cover with Priessnitz dressing, ordinary zinc ointment can be used. Where you cannot bathe with hot water you must depend on liniments—one being as good as another.

At the beginning of inflammation give a quick acting purgative, particularly one producing watery stools. This has the effect of draining fluid from the blood, which then takes up fluid from tissues to make up deficiency, thus depleting the inflamed tissue of the exudate.

We get good results from this line of treatment of laminitis in the horse by giving arecoline, but the cow does not react like the horse. If we give enough arecoline to a cow we may overstimulate contraction of all the four stomachs and intestines and have violent contraction of rumen, regurgitation of food which may enter trachea, and often death follows. Never use arecoline in any dose on a cow. Eserine 1½ grains in connection with pilocarpine 3 grains gives good results in cow. Epsom salts 1 lb. and tartar emetic 1½ drams, or gamboge 1½ drams hurry the action of the salts and increase watery discharge. Diuretics, by increasing elimination of urine, increase the withdrawal of fluid from the blood. Acetate, citrate or bicarbonate of potash are preferable. Phytolacca has a diuretic action and is very efficient.

We can also improve conditions by stimulating circulation. Digitalis becomes macerated in the contents of the rumen and we get no results, but it can be given subcutaneously. Strong coffee (1 pint to each dose) or caffeine subcutaneously (15 to 30 grs.) is a good heart stimulant and diuretic in this condition. Caffeine is not soluble in water but if you add sodium salicylate or benzoate of soda, they render the caffeine soluble and it can thus be prepared for hypodermic use.

In the treatment of phlegmonous variety, bathe with hot water, followed with equal parts of spirits of camphor and alcohol, then put on Priessnitz dressing and keep the cotton moist with this mixture. Frequent milking is also necessary in both the simple, non-infectious mastitis and in phlegmonous form. We

can thus stimulate the flow of blood and milk secretion in all four quarters. Cow should be milked every two hours if possible and at least five times a day. This stimulates circulation and washes off the products of disease, like pus and mucus, bringing out the diseased secretions.

Also in treatment of the phlegmonous type when fever is high we get best results from administration of camphor and alcohol. The best way to administer is one part camphor to four or ten parts of sterile olive oil given subcutaneously in doses of one to two ounces. If you are in a position to repeat, give the smaller dose. Camphor can also be given by the mouth in considerable amounts without disturbing digestion.

After the acute symptoms have subsided in either type keep on bathing with hot water and then also massage the udder and use absorbing ointments containing 10 per cent. camphor or 10 per cent. camphor in linseed oil, or weak solution of iodine. Iodine 2½ drams, potassium iodide 5 drams, lard oil 1 pint, makes a perfect solution and lard oil penetrates the skin better than other fat. This mixture is better than camphor and alcohol after the acute symptoms have subsided. If you cannot continue the hot water bathing and massaging, you can resort to this iodine liniment. When the inflammation is not very severe nearly all cases will recover under this treatment. When inflammation is very severe we may have abscess formation, particularly in the traumatic form, and the inflammation may assume a chronic course, then the connective tissue will multiply, the cells proliferate and this will increase the bulk of udder and produce "caking" or hardening or induration extending over a greater or less area. This must be treated the same as above (after the acute symptoms have subsided) and by the internal administration of potassium iodide, a dram twice a day. Abscesses should be brought to a head as soon as possible by the application of moist treatment and as soon as they fluctuate, open. If they rupture internally we must get out the exudate as best we can by massage and milking.

Catarrhal mastitis, with the infection extending up through

the teats to the large milk ducts, is caused by streptococci usually, sometimes by staphylococci and rarely by colon bacilli.

Staphylococci are common in milk from healthy udders and are considered saprophytic, but under some conditions due to cold, exposure or anything that depletes the animal, these may become pathologic and produce a mild catarrhal mastitis. When streptococci are found in milk and associated with a large number of leukocytes you can be positive that the milk comes from cows affected with catarrhal mastitis. In some cases these streptococci are very virulent to man. They are usually carried on the hands of the milker and can be transmitted through bedding, etc.

The bacteria are the primary cause of the disease but anything reducing the resistance of the udder will act as an accessory cause, such as cold (drafts or cold water to drink), retention of milk in the udder brought about by incomplete milking or allowing the milking to go over time, irritation of retained substances passing through the udder as puerperal mastitis from retention of placenta. The udder is principally a secretory organ but sometimes has an excretory function; if the bowels are diseased, as in simple indigestion, the waste products pass through the udder causing irritation of tissue. Some other causes may produce the disease by themselves. Usually bacteria are there but sometimes it is caused without their action.

Klein recalls an example in which a gentleman wanted his cattle as free from disease as possible and he started in the spring to have the backs and udders washed before each milking. This worked all right until late in November, when some cows showed symptoms of catarrhal mastitis. No streptococci were found, nor staphylococci, nor colon bacilli, but at the base of the teat the skin was slightly swollen, stiff and cracked in places. He assumed that the cold water and then the cold air had started the inflammation. This eczematous condition on the outside caused the inflammation inside. Washing the udder was stopped and after brushing it clean it was wiped with a damp cloth and anointed with vaseline. The inflammation disappeared.

Dr. Klein relates another experience in relation to the effect

of elimination of irritant substances through the udder. A dairy of many cows ran out of ensilage. They were cutting the first crop of alfalfa hay and immediately they began feeding it. It was a sudden change. The cows liked it and went at it strongly. The milk flow increased and they then received more alfalfa. The production of the herd was raised over a quart a day per cow. The cows became affected with intestinal catarrh, began to scour and the milk showed flakes. Catarrhal mastitis was discovered when they were examined. Alfalfa in excess, with disturbed digestion was the cause. Mixed hay was substituted and the trouble overcome. The relation between disease in other organs and the udder is thus shown.

Catarrhal mastitis does not show itself plainly. In the beginning you usually see no signs—no swelling or tenderness as in interstitial mastitis. In a few cases, however, there may be a little swelling in lower part with a little tenderness and heat. The first symptom is difficulty in getting out the milk, the membrane lining the teat canal becoming swollen and the lumen made narrower. Mucus is thrown out, later on pus which may block the canal.

Another symptom is deflection of stream or split stream. Ordinarily, on release of pressure on a normal teat the milk flow shuts off suddenly. In the catarrhal condition it does not, but a drop runs from it. You may have pus or dried milk at mouth of teat canal. If chronic, the inflammation passes through mucous membrane into connective tissue which proliferates, thickens and obstructs teat canal, which may contract and cause stricture. We can feel the thickness in form of cord extending through the teat. Thickened ends of the large milk ducts can be detected by palpation. We can sometimes feel a disc as large as half a dollar above base of teat. The hardness of udder begins at base of teat but it extends up into interstitial connective tissue until the whole quarter is involved. New connective tissue forms, contracts, causes pressure on gland tissue and destroys it, ruining the whole quarter. It may pass through connective tissue of all four quarters.

Retention cysts also may form by the swelling of mucous membrane and the blocking up of the teat canal, the pus or milk cannot get by, the wall of canal becomes distended forming a cyst varying in size from a pea to a walnut and differing from an abscess because it is not hot. While quite firm, if you press it hard you can usually empty it.

The treatment of catarrhal mastitis will depend on the form of the disease. With the infectious type (streptococci) we must be sure to isolate infected cows, disinfect the places they occupied and milk them last. Examine the remainder of herd looking for finer symptoms. If any show split or defective streams, drop of pus or mucus from teat or any thickening of teat, isolate those cows also, take sample of milk to examine for bacilli and leukocytes. The most important things are isolation and disinfection.

A few years ago practitioners thought it was necessary to simply inject antiseptic solutions but it does not work out. You cannot inject solutions higher than the cistern and infective material may be washed higher up into udder by your solution. Antiseptic solutions irritate the udder tissue and frequently increase the inflammation even when diluted to a point where their virtue is doubtful. Frequent milking is better than injecting disinfectants as it washes canal out and does not irritate. The germicidal power of milk which is feeble under normal conditions, is increased in mastitis.

Some drugs, like potassium iodide (45 grains twice a day), given by mouth, will be eliminated through the udder—iodine passes out in the milk. Boric acid by the mouth (2 to 6 drams) will be eliminated through the udder. Urotropin, a combination of formaldehyde and ammonia, can be bought under the chemical name, viz., hexamethylenamin, much cheaper, and can be given in one to two dram doses and this is separated in the body and formaldehyde is eliminated in the milk as well as in the urine. It should be given in combination with boric acid. It has not as yet been proven of how much value these drugs may be in the treatment of this disease but it has been proven that there is no

irritant effects to the udder following their administration and we should all give it a fair trial. The astringent ointments and the iodine in lard oil should be used as advised in the treatment of the interstitial form.

You may use the teat bistoury to cut the membrane in cases of stricture; but always use a sound afterward successively, in order to keep the teat dilated and prevent greater contraction from the connective tissue.

Ordinarily the veterinarian does not get the case in the catarrhal stage but when the membranes have become thickened and indurated.

Parenchymatous mastitis is the most common form with which the practitioner has to contend. It is an inflammation of the epithelial tissue (gland proper); the structure being similar to that of air cells of the lungs. The pathological alterations are similar to those of pneumonia. Congestion and inflammation pushes the cells through the membrane and there is an exudation of blood, serum and leukocytes and wandering connective tissue cells into the acini and ducts of the gland and an exfoliation of the epithelial cells lining the acini and ducts. There is also an inflammatory exudate into the interstitial and subcutaneous connective tissue which is often very pronounced.

A swelling in one quarter and sometimes in more than one is suddenly extensive and pronounced, it becomes hot and painful and the skin is reddened. The milk changes to the appearance of whey, with flakes and clots in it and later is much reduced in quantity and has the appearance of serum with clots of fibrin and casein. Temperature is high. Animal may be lame, may show symptoms of paralysis, may have secondary attack of indigestion or paresis of rumen.

If these exudates are not too excessive and can be removed and the epithelium is capable of regeneration, resolution occurs and the udder recovers. But if the exudates are very excessive so much epithelial tissue may be cast off that the udder cannot recuperate or completely recover.

If the exudates are not removed and the circulation not re-

stored to normal within a certain period, the inflammatory process in the interstitial tissue assumes a productive character, and the udder becomes indurated. Later this connective tissue contracts and produces atrophy of the gland tissue proper. If exudate does not get out it may occlude ducts and produce abscesses or it may interfere with circulation to a section of the inflamed area, when necrosis or gangrene may occur. Resolution or recovery then depends upon the prompt removal of the exudates. The exudate in the acini ducts and cistern can be drawn off by frequent milking, but that in the interstitial tissues must be reabsorbed. Give a quick purgative followed by heart stimulant—diuretics. Apply cold for twenty-four hours, then hot water bathing, Priessnitz dressing, astringent lotions and, where temperature is high, treat with camphor and alcohol. Give urotropin and boric acid. After the acute symptoms subside get rid of the remaining exudate by hot water, massaging and camphor ointment. The udder should never be massaged until the acute inflammation begins to subside.

Induration should be treated the same as described in interstitial mastitis, by potassium iodide internally, massage and iodine and potassium iodide in lard oil externally. Necrosis and abscesses must be treated surgically.

In regard to the treatment of mastitis by bacterial vaccines, the concensus of opinion by investigators to-day, and the results of their work show that we can expect little success from their use.

DR. SCHNEIDER APPOINTED MEMBER OF THE PENNSYLVANIA STATE BOARD OF VETERINARY MEDICAL EXAMINERS.—We learn with much pleasure, from the Philadelphia *Journal of Commerce* of January 2d, of the appointment by Governor Tener of Dr. F. H. Schneider, of Philadelphia, a member of the State Board of Examiners. As a general practitioner, Dr. Schneider has been very successful, and is held in high esteem by his clientele. His qualifications for the position to which Governor Tener has recently appointed him is fully appreciated by his friends in the profession all over the country, whose sentiments are expressed by the REVIEW in hearty approval and congratulations.

THE NEED OF MUNICIPAL MILK INSPECTION.

By G. H. Conn, Prairie Depot, Ohio.

Milk and meat as foods have received much more consideration at the hands of investigators as food products, because they are used as food by many more people than any of the other food products, and because milk is primarily a food for the young. Cows milk is especially much used in the cities as food for the babies, where many of them are bottle fed. It seems to me that the procurement of a wholesome and pure milk for the people, and one that is cheap and nutritious, for the people of our country, and especially for the babies, would be a work in which any one should feel proud to be engaged and should receive more consideration at the hands of veterinarians than it does. Too many of us veterinarians do not pay any attention to matters of this kind simply because our municipalities do not make provision for such inspection. Milk not only carries disease to the human family, but it decomposes very rapidly; and, besides, there are many people who are so unscrupulous as to adulterate it in various ways. By careful observations and tests, methods have been perfected by which these frauds may be detected.

It was formerly thought that anything to be of any value concerning the public health must come from the regular medical practitioner, but the recent advances in comparative pathology and therapeutics have taught the people that the individual who has had special training along such lines is the individual that is best prepared to handle the situation, and for this reason the veterinarian is better fitted to handle the inspection of milk than any other because he has had special training in the diseases of the domestic animals and diseased conditions that may result from the consumption of some of their food products.

In the production of milk for human consumption, the very

first act is a violation of nature's law. Nature intended that the young of those animals who nourished their young with milk should draw the milk directly from the udder. Milk in being drawn by hand or any other artificial means for the use of those who may use it for food is sure to undergo more or less contamination; the dirt and bacteria on the teats, the loose hairs on the body, the dandruff from the skin, the particles of dust in the air from dusty fodders and hay, and several others all contribute to contaminate milk when it is artificially drawn for human consumption. The time elapsing between the drawing of milk and its consumption and the rapidity with which it develops bacteria make it necessary to use the utmost precaution in handling it. When calves are fed on milk from the cow drawn artificially, the contamination, decomposition and irritant properties that develop oftentimes prove dangerous and many times fatal because of the gastric-intestinal conditions which they cause. Infants often suffer with this same condition, and in the cities where bottle-fed babies are common, from 10 to 20 per cent. of the infant funerals are from this cause alone. In one of the large cities of this State where they have had competent and rigid municipal milk inspection, during the first three years infant funerals were reduced 33 1/3 per cent., some record to be proud of, I should think.

The stalls where cows are kept should be cleaned some time before milking, so that the cows may be well bedded down and the dust have time to settle and the odors to banish; the attendant who does the milking should not smell of the odors of other farm animals with which he may have been working and should wear clean clothing and should have clean hands. It is a common practice with many milkers to go to milk without washing and then wet the hands with the milk during the milking, this is very unsanitary and should be discouraged. The cows should be cleaned before milking and the udder wiped with a damp cloth; the opening in the top of the pail should be as small as possible to permit milking, as this will keep much dirt from getting into the milk; the pails and vessels in which milk is handled should

be so constructed that the milk could not collect around seams and thus be a breeding place for bacteria that are usually associated with milk.

It is the large dairies that furnish milk for the people in the large cities, and it is in these large dairies that the cows are forced for a large milk production, and for this reason they are not able to withstand disease as well as they would under more favorable conditions, and therefore the milk from such cows and the cows themselves should be under competent inspection.

Cows that have diseased udders are sure to give off some of the infection when the milk is drawn; also, in diseases where the other eliminating channels are not working properly, infection and poisonous products are sometimes given off with the milk. I feel that many of the diseases of infants in particular are due to some infection in the milk, especially where they are fed on cows milk, due to streptococci and other virulent strains of infection and their poisonous products.

The reason milk is not recognized as the cause of more of the ailments of children, than it is, is due to the fact that there are too many doctors who do not make enough effort to find the cause of many of these conditions, being very willing to call them summer complaint, indigestions, etc.

It is a recognized fact by a large number of the best authorities on medicine at the present time that bovine tuberculosis may be, and in fact is, transmitted to human beings through the milk of animals infected with this disease; this affects children under two years of age principally, although older children and occasionally adults contract the disease in this way. Dr. Park, an eminent physician of New York City, is authority for the statement that the bovine type of tuberculosis is the cause of the death of two to three hundred of the infants in that city each year; a mighty hard blow to the mothers of New York to bear for a condition that could be remedied.

Great care should be taken in the production of milk, so that the attendants who care for the cattle do not infect the milk with various diseases with which they may be associated, or

be the virus carriers for them. Many times people have been infected with typhoid fever, scarlet fever, diphtheria, etc., simply through the milk that they have consumed.

The water in which the utensils are cleaned should be pure and free from any diseases that might render the milk dangerous to public health.

The time elapsing between the drawing of milk and its being consumed by our city cousins in many instances is several hours, and this makes it all the more necessary to have a system of inspection that will compel the producer to make the necessary provision for the proper delivery of his product to the consumer.

There are several methods used by those dealers who have no regard for fair dealing in adulterating their products, and where inspection is maintained these frauds can be detected and the person punished for so doing. These consist chiefly of artificial preservatives and flavors; and watering is quite a common practice in some places in this country.

Many of the conditions mentioned in this article could and would be greatly benefited by competent municipal inspection, and several of them could be eradicated, and by so doing would be a great protection to the people of the municipality.

CANADIAN VETERINARIANS MEET IN MONTREAL: The first congress of the veterinarians of the Province of Quebec was held January 20 and 21 at *L'Ecole de Médecine et de Science Comparée, Lvaal*, 381 De Montigny street, East, Montreal, Canada. The program includes our own Joly of Maine, and Higgins and Torranee, who, while Canadians, are of us through the A. V. M. A. (just as Dr. Etienne, secretary of the congress, is related to the veterinarians of the States); and embraces amongst its subjects, *Production of Vaccines, Toxins, Anti-Toxins, Biological Treatment of Equine Influenza* and kindred subjects. *A New Theory of the Etiology of Shoe Boil* is also numbered amongst the papers. The clinic, held at Chamlet's Riding Academy, Montreal, as well as the discussion of the papers, provided solely for the recognized members of the profession and their friends; admission could only be obtained by cards issued by the executive committee.

WHAT IS IN STORE FOR US.

By L. C. Kigin, Deputy State Veterinarian, Lincoln, Nebraska.

Spending last evening in the lobby of the hotel, mingling, meeting, and shaking hands with the different legislators, who had just congregated, the thought came to me, as I gazed over that vast body of lawmakers, "What consideration will those men give to the advancement of the veterinary profession in this state?" I wondered if they would entirely overlook this important branch of science and go back home, some time in April, without passing at least one law that would advance our standard. I, for one, cannot believe that the Nebraska legislature will treat us in this manner.

If I could only deliver the message, as I see it, we would have many good laws placed upon our statutes, this session. In my opinion, one of the most needed laws of this state, as well as every other state in the Union, is to create a Board, giving this Board the power to revoke the licenses of practicing veterinarians who disregard not only the ethics of our profession, but willingly and knowingly violate every moral law and principle, endowed in man. Allowing such imposters to practice, is what has poisoned and killed our advancement. I believe that I am in a position to know what I am talking about, when I make this assertion.

I, as well as every other State Veterinarian, receive the complaints from the poor, innocent client, who has been mistreated. Many times these complaints have been so numerous and serious that I wish I had chosen another profession. I want to say, right here, that I am not making a charge against the veterinarians, as a whole, in this state, as I know the veterinarians of this state, as a whole, are as clean and honorable and scientific a body of men as can be found in any other profession, whether it be medicine, law, or what not. But we have a few wayward sons, as every other state has.

A standard has been set in the Nebraska Veterinary Medical Department that every veterinarian must work in accordance with, or his services will be severed, exclusively, upon findings of his wrongdoing.

Going back to what the legislators can do for us, I wish to state that I expect to go before that assembled body, if permission is granted, and give them the privilege of gazing upon 3,000 feet of motion pictures, that I have taken over this state, showing tuberculosis among the dairy cattle, from every phase and angle. At the same time they are viewing these pictures, which they have never had an opportunity to see before, I expect to deliver to them an address of explanation, and make an appeal for laws to be passed, that will assist and enable us to eliminate such existing conditions, in this state. Their only means of assistance is to give us the law previously mentioned.

I believe that the most serious problem that faces America to-day, is the elimination of tuberculosis among our dairy herds. My experience, in this office, has led me to believe, and to make this statement. Of course, many others have had much more experience than I. In reading over Government reports, I feel that they have the same fear, that if this matter of eradicating tuberculosis is not taken in hand, in an educational way, that this disease will destroy millions of dollars worth of valuable live stock in this country in the next few years. In order to bring about good results, I feel that a good quarantine law is of extreme importance, not merely to quarantine diseased stock that has been bred and raised in this, or any other state, but to quarantine an interstate shipment, when, in the opinion of the State Veterinarian, he deems that additional tests should be made, in order to feel safe that he is not allowing diseased animals to creep in, that will in time, infect many of our healthy animals. I believe, furthermore, in such a quarantine law, it should be specifically stated that all expense of such tests should be borne by the owner, and in this way, it would make them a little more cautious and careful in bringing stock from one state to another. If a cow, or cows, are found to be affected with tuberculosis,

they should be shipped, not later than 15 days, to where they will be killed under government supervision. It might be that some states have a law, at the present time, on their statutes of this kind, but I am sorry to admit that Nebraska has not. It should be the aim of every state to have such a law passed in the next meeting of their session of legislature.

Too many veterinarians, in my opinion, have assembled around these bodies of legislators and asked them to support a practice act. I believe that they have begun at the wrong end. The reason is, that the legislators will not recognize the value of the veterinary profession, as long as we have veterinarians in our rank and file who continue to do the disreputable work that has been done in the past.

Therefore, I still contend that a Board should be created, which would make an investigation of a veterinarian whom charges have been made against, and, if they find that this man is guilty, his license should be revoked, and I am very sure that not many more assembled bodies of legislators will convene, in the United States, until our value will be recognized and they will turn a listening ear to our call, and we will stand in rank and file, where we belong and where we have been striving to reach.

AMONG the interesting features in the last number of *The Inspector* that reached us, were cuts of National Secretary S. J. Walkley; of Hon. C. O. Lobeck, Congressman, of Nebraska, Father of the Lobeck Bill, H. R. 9292; Hon. J. Hamlin Lewis, Senator, of Illinois; Hon. Asbury F. Lever, Congressman, of South Carolina; Hon. Thomas P. Gore, Senator, of Oklahoma; Hon. Chas. F. Booher, Congressman, of Missouri, and last, but by no means of least importance, Dr. J. F. Gibson, President, National Association of B. A. I. Employees.

REVIEW WORTH FOUR TIMES THE PRICE—Dr. C. W. Fogle, Leipsic, Ohio, writes, in renewing his subscription: "Enclosed find check for next year's subscription. I could not do without it for four times the price."

SHALL WE ADOPT THE USE OF HOG CHOLERA SERUM AND VIRUS AS AN IMMUNIZING AND CURATIVE AGENT.

By S. J. MARQUARDT, D.V.M., BARNESVILLE, OHIO.

The time has passed when the practicing veterinarians in the rural districts can say that "I, for one, will not have anything to do with hog cholera," and in some instances referring the cases to the State authorities to do the work. But the time has arrived when each and every veterinarian must take a stand for or against its use.

The writer, for one, has never been wholly convinced of the advisability of the indiscriminate use of the serum and virus in the control of hog cholera for the following reasons: First,—Because of the danger of spreading the disease; as we are all acquainted with the fact that hog cholera is rapidly spreading into localities where its presence has not been heard of for years, and we know the serum has been used in those localities by the simultaneous method, and still the disease spreads. There has always lurked in my mind doubt that the use indiscriminately in the hands of the average veterinarian was not a safe way to deal with the dreaded disease. Mistaken diagnosis has much to do with the spread of the disease, and here is where the use of the simultaneous method, where there is any doubt whatever existing, as anyone can readily see that there is great danger of infecting entirely free premises.

Some may say that there is no danger, but does any veterinarian report 100 per cent. cures in any method used. Some States report 48 per cent. of all hogs treated saved, some a still higher percentage. None of us wholly discredits the value of potent hog cholera serum. Many hogs have undoubtedly been saved, but why the spreading of the disease?

The writer has never seen any literature relating to the possibility of immune sows or gilts being carriers of the disease in

their bowels or skin, and excreting them after farrowing time, and thus inoculating their progeny. The writer has at present under his observation a similar case which is untraceable to any other cause than the above mentioned one. The sows remain comparatively healthy and the pigs, at five to eight weeks old, contract the disease. The sows were shipped into this locality from a section of the State where hog cholera is known to have existed. This point, it seems to me, is worth investigation, and a hearty co-operation of all the veterinarians throughout the United States.

The serum manufacturers all over the country would, no doubt, welcome the day when all hogs were immunized by their products, but to my observation this procedure seems futile when the end in view is the eradication of the disease. Can we not dispense with the virus, as it is dangerous to use even under the most favorable circumstances. Each and every veterinarian should be a public benefactor and a sort of guardian over the live-stock in his community, and not help to perpetuate dangerous schemes and devices at our hands to replenish our purses.

[NOTE.]—Dr. Marquardt's letter of transmittal suggests such an earnest desire for an honest and unbiased expression from his brother practitioners that we append it as a footnote to the article.—[ED.]

Barnesville, Ohio, January 12, 1915.

THE AMERICAN VETERINARY REVIEW, New York City, N. Y.:

DEAR SIRS—Enclosed you will find a contribution to your valuable journal, which periodical I value very highly. I have been a constant reader of same for ten years, and could not be induced to dispense with it. This article, which I am contributing, is probably too briefly dealt with, but my object is to get this subject before the readers of the AMERICAN VETERINARY REVIEW, with the hope that the profession will arrive at some definite working basis.

With best wishes, I am,

Very respectfully,

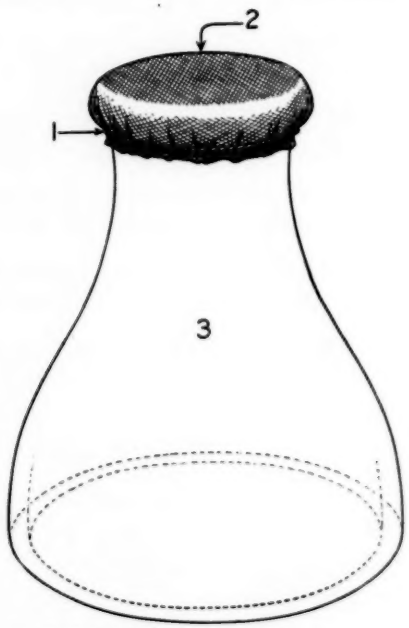
S. J. MARQUARDT, D.V.M.

NEW DATES OF IOWA STATE ASSOCIATION MEETING: The Iowa Veterinary Association, scheduled to meet at Cedar Rapids, December 9, 10 and 11, 1914, but postponed, has arranged to hold its meeting February 9, 10 and 11, and carry out the original program. It is hoped that *all* will be able to attend at that time.

AN IMPROVISED TRANSPARENT ETHER CONE FOR SMALL ANIMALS.

By Crittenden Ross, D.V.M., New York, N. Y.

No doubt many in the veterinary profession have at some time desired to anæsthetize some small animal, and because they had failed to secure a cone or some other apparatus for the purpose are found administering it merely by holding cotton, saturated with the desired anæsthetic, to the nose. The latter



1. String holding gauze on top.
2. Gauze.
3. Upper 4 inches of ordinary pint milk bottle.

is better than no anæsthetic, but in my opinion requires more time and more of the drug; all of which is unnecessary, as will be shown later.

Now for those who do not have satisfactory apparatus for the administration of anæsthetics to small animals, the writer submits a cut to illustrate a very convenient cone. This cone is made from an ordinary pint milk bottle by cutting it about

four inches from the top; this cutting may be done in several ways, such as with a glass cutter, or by burning a string (saturated with alcohol or oil), tied about the bottle, then dashing cold water over it, or by the use of a file to cut a grove around the bottle and then break it. There are many other methods and each party may choose his own plan. After the bottle has been cut or broken the edges should be smoothed with a file, then a strip of gauze, two to four layers in thickness, placed over the mouth and tied there with a string as shown in the illustration.

Now the cone is ready for use and a pledget of cotton containing the desired anæsthetic is placed in the cone near the gauze, and then the cone is placed over the patient's nose and face (a quart bottle may be used for larger dogs), after the patient is once asleep the cotton may be removed and the anæsthetic dropped on the gauze as needed.

The feature in this cone which gives it an advantage over others, and which suggested the milk bottle to the writer, is its transparency, making it possible for the anæsthetizer to watch the eye of the patient during the entire operation, it is also inexpensive, and practically indestructible.

THE PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION will hold its thirty-second annual meeting on March 2d and 3d, 1915, at the Veterinary School, University of Pennsylvania, 39th street and Woodland avenue, Philadelphia. Secretary Reichel, in behalf of the association, extends the usual cordial invitation to all interested veterinarians.

THE number of colts raised annually in the United States is about 1,700,000, and the demand not only exceeds the supply, but prices have been soaring for the past ten years. Such being the case, it is no exaggeration to state that, in spite of all the breeding which may be accomplished during the next two or three years, the supply will not even reach, to say nothing about meeting, the demand.—(*The Horse Lover.*)

CANNOT WELL DO BUSINESS WITHOUT THE REVIEW—Dr. H. W. Skerritt, Utica, N. Y., writes in renewing his subscription to the REVIEW: "Enclosed find check for the REVIEW; we cannot well do business without it."

REPORTS OF CASES.

REPORT OF SOME CASES MET DURING THE PAST YEAR.*

By W. C. Bromaghin.

During the period from about June 1, 1913, to the beginning of this year (1914), I had no less than twenty cases, all of a similar nature, of which I was unable to arrive at any definite conclusion in regard to diagnosis, and will endeavor to describe the condition in a few cases.

No. 1. About May 25, 1913, a two-year-old-grade percheron mare colt a month at pasture. Owner called, complaining that colt acted very strangely. Upon arriving, found animal unable to walk, due to muscular inco-ordination of extremities which was quite complete. Animal could rise with assistance, but could not walk, due to the inco-ordinate nervous impulses which were given off to the muscles of locomotion. I looked for luxation of the ospine. I tested the sensory impulses. I looked for abnormal attitudes. When animal was lying down, everything appeared normal. I tried to obtain history which would sustain the impression that the condition was produced by tromoter influences, but failed.

All the body functions were normal from a clinical observation. I finally decided the condition was of central origin, and so had to fall back on our friends in need, alteratives and reabsorbitants for therapeutic measures, and after placing in slings and formulating a diet I ordered her given one dr. of K. I. daily for two days, then two dr. daily. This animal remained in this condition for four weeks, appetite during this period remained good, and even improved in flesh. No atrophies presented themselves. I finally decided the case hopeless and ordered destruction.

No. 2. About May 15, 1913, a yearling standard bred colt; second week at pasture, with the same identical condition as previously mentioned, was brought to the barn on a stoneboat and placed in a large, roomy box stall with same K. I. treatment. This

* Reprinted from the proceedings of the Seventeenth Annual Meeting of the Minnesota State Veterinary Medical Association.

colt made a complete recovery in four weeks and was turned out again, after which he developed the same trouble. He was brought in again and remained in this box stall four months, made a partial recovery. He is now at pasture with a decided fault in locomotion.

No. 3. Bay, two-year-old, with the same condition, was placed in a large, roomy box stall with same K. I. treatment, with a good recovery in six weeks, and was then turned out to pasture again.

No. 4. December, 1913. Grade percheron mare, 7 years old, had been hauling cord wood every day, was found in this condition when owner was about to hitch it to a load in the morning. I made a careful investigation in regard to feed and found that the corn which the owner was feeding was moldy, and told him to discontinue feeding this soiled food and placed the mare in a padded single stall and ordered K. I. This animal made a good recovery in three weeks with the exception of a slight drooping of one ear and a tipping attitude of the head toward that side. She remained in perfect physical condition and was afterwards put to work and has been in active service ever since, but still has that peculiar tipping of the head and drooping of one ear on the same side. I had several other cases of the same condition, the most of which terminated unfavorably after several weeks of treatment and a few of which were never able to rise from the onset. I have had no cases of the same nature this season so far.

Milk Fever.

Being located in a section which favors the dairy industry, I am naturally called upon to treat a large number of milk fever cases, with which I have been quite successful with the exception of a few cases, some, at least, of which I can account for their unfavorable termination. The secret in the favorable termination of the milk fever case lies, I believe, in its manipulation by the owner before the veterinarian arrives. How many of these cases, after lying in a prostrate condition in some instances for several hours, and upon being discovered by the owner are propped up on their sternum, are turned over only to die of suffocation about the time, or soon after, the veterinarian arrives. As I positively know from experience that they will die if they are turned over. I then resolved to find a plausible explanation for this unpleasant discovery, by posting a few. In nearly every case I found the lower lung in an extreme hyperstatic condition, a passive congestion to the extent that it would no longer float on water. We all

know that this condition must exist in the animal which has been lying prostrate for several hours, but we do not stop to think what is liable to happen if we turn her over. Knowledge obtained by experience is seldom forgotten.

NERVING TO RELIEVE A CHRONIC HYPERSENSITIVE CONDITION OF THE SKIN OR CHRONIC DERMATITIS OF THE REGION OF THE PASTERN.

With me the treatment of a case of chronic dermatitis in the region of the pastern is very unsatisfactory, especially of those cases of enormously thickened and even hypertrophied derma of the region. The duration of a routine treatment which would effect a relief in these cases is so long that the owner becomes discouraged and eventually no relief is the outcome. To the average practitioner this may seem rather radical measures to adopt for the relief of this condition, but it will relieve it and I have patients which have been in active service for two years without any unpleasant sequelae as yet. I reset a small portion of the plantar nerves just above the pastern which is the high plantar operation. I do not wish to commit myself or make myself conspicuous by recording my failures or successes, however, a few practical ideas gained by actual experience may be of some value to the average practitioner, while scientific theoretical tabulation is sometimes of questionable value, when applied in practice.

SOME INTERESTING CASES IN MY PRACTICE.*

By OTTO FAUST, D.V.S., Poughkeepsie, N. Y.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

Case No. 1. On August 3, 1913, I was called to see a filly owned by O. Mills of Staatsburgh, N. Y., with the following history: Ever since it was a small colt, there was noticed a periodical weeping of the left eye; no attention was paid to this condition until July, when the filly was taken up to break, when they found that pus was being discharged from its weak eye, I could find nothing but an inflammatory condition of the conjunctiva, for which I prescribed hot fomentation and applications of a solution of boric acid.

*Read before the Central New York Veterinary Medical Association at Syracuse, November, 1914.

About three weeks later, I received word that the filly had seemed to improve, but was now as bad as ever. I advised sending her to the hospital which they did.

After receiving the colt at the hospital, a more rigid examination was conducted; said examination disclosing the fact that the lower opening of the lacrimal duct was absent. Then I concluded that this must be the source of trouble, and decided to operate.

Operation: On account of the field of operation I used chloral hydrate one-half hour before placing her on the table; after being properly secured on the table and the head and face thoroughly washed, I passed a special long catheter into the upper opening of the duct as far down as possible.

I then tried to trace the end of the catheter through the nostril, failing in this I painted the space between the pre-maxillary and nasal bones with iodine and made an incision 2 inches long, parallel with the nasal cavity through the skin and false nostril to the nasal cavity, one and one-half inches above the wing of the nostril.

I could then feel the catheter in the canal, and with a curved bistoury I cut down on it. Pushing the catheter through this opening I passed it through the natural opening of the nose, tying both ends of the catheter together. After painting the external incision with iodine, three sutures were placed in the skin.

Removed colt from the table and placed in stall, tying both ways so that the catheter could not be disturbed.

Every day the catheter was moved up and down, the inflammation subsided from the eye and discharge ceased. After two weeks I fastened a silver wire to the stiletto of the catheter and carefully pulled the wire into the catheter, then removed the catheter, leaving the silver wire in the canal for two weeks longer; after which it was removed, and the colt discharged as well.

I have seen the colt this summer and there has been no discharge since her return home.

Case No. 2. On May 27, 1914, a yearling filly owned by the Hudson River Stock Farm, while being driven on the track, was suddenly startled by some hay thrown from a mow on the side of the track. She plunged forward and fell with her hind legs straight back, so that the median line of the abdomen was on the ground. After unhitching her from the sulky she struggled to her feet and was led to the stable about a quarter of a mile away.

When I arrived at the farm, I found her down in the box stall, body wet with perspiration, temperature 102, pulse 50, respiration 28. With assistance we raised her to her feet, but she only remained standing about five minutes, when she again lay down. I could find no injury except around the upper end of the left scapula, which seemed to be sensitive. I ordered her body wrapped in hot blankets to be repeated every hour through the night.

The next morning she was unable to rise with assistance, urine passed involuntarily while she was down, fæces had to be removed by hand, and she showed great pain on being moved. From these symptoms I diagnosed her case as a fracture of the spine and advised her destruction, which was delayed until the next day on account of the owner being out of town; in the meantime she was made as comfortable as possible.

The next day she could not raise her head, paraplegia being complete; I chloroformed her.

Post-mortem Report: I removed the left foreleg from the body and started from the last rib, sawing them about four inches from the spine, when I reached the ninth rib I noticed that it was not as firm as it should be and completed the fracture by sawing, the remainder of the ribs except the last being loose, I was very careful so as not to displace them. On the inner side of the ribs I found a large hæmorrhagic surface close to the spine corresponding to the injured ribs. I then examined all the organs but found nothing abnormal. I then turned the carcass over, removing the right foreleg, and sawing all the ribs about four inches from the spine found all of them whole, then sawed the spine across at the first and the tenth ribs. Carefully examining the eighth left rib, I found an incomplete diagonal fracture between the articulation and the tuberosity, the 7th, 6th, 5th, 4th, 3d and 2d ribs were in the same condition. I then made a longitudinal section of the spine and found a fracture of fifth dorsal vertebrae with small blood clots in the canal.

Now the question which I have not settled in my mind is, whether the lesions resulted from muscular contraction or from the concussion of the fall on the abdomen?

Case No. 3: On January 3, 1913, I was called to A. Brown's place, at Hyde Park, to see a yearling thoroughbred Percheron filly with the following history. Shortly after turning out filly for exercise, she was seen laying down and rolling; she was then led to her box stall, where she again showed pain. Simple remedies were given for six hours, when I was sent for.

Symptoms: Lying down with occasional rolling, told to get up she jumped to her feet and remained quiet long enough for me to take her temperature, which was 101, pulse, 56; respirations, 26; when she again, looking around at her flank, laid down. At this time there was no bloating, but her abdomen seemed full. I then made a rectal examination and found a constriction about twenty inches from the external opening, through which I could not pass my finger; taking a small catheter I was able to pass it without any trouble. I then tried to dilate the opening, but could not. Taking a gallon bag syringe filled with warm water with one ounce of hyoscyamus tincture, and connecting the hose of the syringe with the small catheter which was passed through the constriction, allowed the solution to enter the bowels beyond the constriction, which I ordered repeated every two hours; also gave tincture of dioscorea and tincture of hyoscyamus alternately, 30 drops every half hour.

The following day I found the filly worse, temperature, 103; pulse, 70; respirations hurried; standing backed in the corner of the box. The owner having been notified the night before of the fatal condition of the filly, I again wired him for permission to destroy her. Not receiving an answer from the owner, he being out of the city, the same treatment was continued until four a. m., when she died. The morning of the fifth I posted her.

Post mortem: Realizing that my trouble was located in the floating colon close up to the rectum, I placed the colt on her back, spreading both hind legs as much as possible, cutting from the xiphoid appendage, following the borders of the false ribs on both sides to the flank, curving inward close to the hind legs, to the pelvis, exposing the internal viscera.

Standing on the left side of the carcass and raising the pelvic flexure of the large colon, I exposed the floating colon which I found intensely inflamed from the rectum about four feet forward.

In this intensely inflamed area I saw a band about one inch wide circling the colon; lifting the colon up I found on the inner side what looked like a tumor. By pushing this tumor back through the ruptured mesentery, I discovered that the tumor was the left ovary which was hypertrophied and pedunclated, about the size of a billiard ball. The opposite ovary was normal and in its proper position.

Case No. 4: On September 25, 1914, I was called to see a horse owned in Poughkeepsie that had picked up a nail while at work on the 21st, the nail penetrating the right hind foot near the

point of the frog. I removed the shoe and trimmed the foot as much as possible, getting a quantity of pus, and ordered the foot soaked in a hot creolin solution, to be followed by a flax-seed poultice. I injected 3,000 units of antitetanic serum.

On the 26th I again saw the patient, washing the foot with a warm creolin solution. After trimming the foot again, I dressed it with cotton and creolin, ordering the dressing repeated morning and night.

On September 28th the owner drove the horse to the hospital, saying he acted stiff and did not eat well. He was unhitched and brought into the hospital and a diagnosis of tetanus made.

Treatment: September 28th at 4 p. m. injected 24,000 units of antitetanic serum and placed in a dark box stall, patient could not eat or drink.

September 29th at 8 a. m. patient unimproved, injected 24,000 units, and repeated 1,500 units of serum at 6 p. m. The rectum was cleared of feces by hand and injected one-half gallon of a mixture of milk, eggs and whiskey.

September 30th at 8 a. m. no improvement in patient's condition, injected 18,000 units, and repeated the 18,000 units of serum at 6 p. m.

October 1st at 8 a. m. patient was more excitable. I injected 24,000 units, and repeated the dose of 24,000 units at 6 p. m., continuing the rectal feeding.

October 2d as I only had 12,000 units left I injected 6,000 units at 8 a. m., and repeated the dose at 6 p. m.

October 3d patient seemed improved, being able to drink a pail of oat-flake gruel. Rectal injections were discontinued, as it seemed to excite him. I injected 9,000 units at 8 a. m., and 9,000 units at 6 p. m.

October 4th patient able to drink and eat a little bran mash with difficulty. I injected 6,000 units at 8 a. m., and repeated the dose, 6,000 units at 6 p. m.

October 5th patient about the same, I injected 6,000 units at 8 a. m., and repeated the dose at 6 p. m.

October 6th patient seemed not so well, refusing to look at feed and did not care to drink. I injected 9,000 units at 8 a. m. and repeated the dose, 9,000 units at 6 p. m.

October 7th patient able to drink and nibble at some hay; I injected 9,000 units at 8 a. m., and repeated the dose at 6 p. m.

October 8th, the muscles of ears and neck relaxing a little, injected 9,000 units at 8 a. m., and 9,000 units at 6 p. m.

October 9th patient able to eat about 2 quarts of bran mash

and drink considerable water. I injected 9,000 units at 8 a. m., and 9,000 units again at 6 p. m.

October 10th the horse would move about the stall more freely; I injected 9,000 units at 8 a. m., and 9,000 units again at 6 p. m.

October 11th patient about the same; injected 9,000 units at 8 a. m., and 9,000 units again at 6 p. m.

October 12th the muscles of neck relaxing a great deal, so much so that he could almost reach the floor. Injected 6,000 units at 8 a. m., and 6,000 units at 6 p. m.

October 13th, patient improving rapidly, eating and drinking very well. I injected 6,000 units at 8 a. m., and 6,000 units at 6 p. m.

October 14 patient able to eat hay from the floor and move around the stall very well. I injected 3,000 units at 8 a. m.

October 15 patient on the road to recovery; injected 3,000 units at 8 a. m.

October 16th the muscles of the body somewhat stiff, but otherwise the patient was gaining rapidly. I injected 3,000 units at 8 a. m., which was the last injection.

October 27 patient discharged from the hospital and owner advised to turn him out in a paddock through the day. The horse was allowed to run out until November 8th; he was shod an November 9th and was put to work.

Total amount of serum used, 342,000 units, at a cost of $171.

IMPACTION OF THE CAECUM—RUPTURE—DEATH.

By Robert W. Ellis and Crittenden Ross, New York, N. Y.

Dr. Ellis: On November 16, 1914, an aged gray mare, of the ordinary work-horse type, weighing about 1,200 to 1,250 pounds and measuring about fifteen and a half hands in height, was brought to the office door by her owner, with the history that she had not eaten for about eight days, and the request that I "fix her teeth." I examined her mouth and found a few spiculae here and there, but did not consider that her teeth were sufficiently bad to be the cause of her not eating for that length of time; although I thought they might be the contributory cause, through imperfect mastication of food, giving rise to indigestion. I explained my impressions to the owner, and, being late in the evening, suggested going to his stable in the morning to float the mare's teeth, and if I found she carried no fever, would physic

her, and follow that up with a tonic. He fell in with my plan readily, which was followed out the following morning, November 17. The mare's temperature registered 100.5 degrees F., and accordingly, after the teeth had been leveled by the cutting down of the projecting points, a physic ball was administered and a bottle of tonic medicine left to be given in two-ounce doses three time a day *after* the physic ball had completed its work. That was the last I saw of the mare. On November 20 (three days later) a hurry call came into the office from the owner of the mare, to which Dr. Ross responded, and he will tell the rest of the story.

Dr. Ross: In response to the above call I went to the stable and finding the same locked waited outside until the owner returned, during that period of time I heard no noise inside and began to feel that it was a false call and started to return to the office, but met the owner, and upon examining the animal found her with flanks tucked up, nostrils dilated, respirations deep, and pulse very rapid, when brought from the stall she showed a very uncertain gait, reeling from side to side like a man under the influence of intoxicating liquor; her head was held very low, and because of her actions, I considered it dangerous to attempt a rectal exploration, and being asked by the owner, "What do you think of her?" I made an immediate reply that death was the only thing left for her, and to relieve her pain I administered some cannabis, but before one-half hour she had breathed her last.

Post mortem: Upon opening the abdomen a large quantity of blood-colored fluid escaped with some food material in it. As I began the removal of the bowels I found the cæcum distended and the contents very firm, at the base of said organ were two ruptures separated by four inches of the wall.

The large and small colon had a semi-fluid content. While the small intestine was practically empty the stomach contained a small quantity of water, the peritoneum appeared thickened and raised in folds. The other organs were not examined.

GANGRENE.

By A. T. Ferguson, D.V.S., Evansville, Indiana.

On December 10th I was called to see a bay gelding which was about 12 years old and weighed about 1,000 pounds.

On carefully examining this case I found him extremely lame, so much so that he would not place any weight on that foot, it being the left front. I diagnosed the case as foot lameness, with the pastern inflamed and also the tendons. But the owner was kind enough to inform me I was in error, and that the lameness was from the shoulder. I carefully examined the shoulder and again told the owner it was a foot trouble. But I did not succeed in persuading him. So to satisfy him I blistered the shoulder against my judgment and will. Sometimes one has to doctor the owner more than the animal. I then proceeded to dress the lower part of the limb. The next day I was informed that this animal had been subject to corns for two years and was lame off and on.

I had already examined the foot and could see no sign of corns. However, I had the shoe removed and a very small, hard corn was found. The animal did not show any signs of pain from this corn while it was being trimmed, even to making it bleed. I concluded the trouble was more serious, and was confined to the inside of the foot. The leg being somewhat swollen and the pastern very much so and very painful when lightly touched. I placed a light blister on the leg, but the blister did not take, for the reason that there was a serum oozing through the skin which hindered my blister from doing its work; but it seemed to have drawn the trouble to the surface near the quarter and I then applied iodine. But the foot grew worse in spite of every effort I made and resisted every form of treatment until I could see the foot gradually mortifying. The pulse became small and almost imperceptible, but the animal would eat and lay down nights. This went on for ten days, and seeing that gangrene had set in I notified the owner that it was no use to continue the treatment. But he was a poor loser, although in good circumstances and well able to take a loss. Instead of taking my advice, he tried about every stable man he could find to take this horse off his hands; but all seemed too wise, and he finally had him destroyed. Had he kept him another day or two it would have been a dead animal anyway.

Now, I believe the cause for this gangrene was that after two years of suffering from this corn that the tissue became weakened and that the intense cold (being zero) must have frozen this foot; or might have so chilled it that it produced mortification, which involved the whole of the foot, producing a nauseating odor. This is the third case I have had of this kind in four years. What's the remedy?—The gun.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. Liautard, M.D., V.M.

Permanent Disablement Following Fetlock Injury [*W. Cargill Patrick, F.R.C.V.S.*].—Seven-year-old hunter showed lameness after a day's hunting. After a few days a good deal of thickening and swelling took place around the near hind fetlock. Great lameness and pain with systemic disturbances. Local treatment was followed with temporary relief. The swelling returned and several abscesses formed and discharged. X-rays were then applied to find the true condition of the joint. Skiagrams were not satisfactory, and a second application resorted to one week after. Shortly afterwards a good deal of improvement was manifested, and lasted so that after two months the horse appeared sound. But after a short spell of exercise, the condition returned as bad as ever and finally the horse was destroyed. At the autopsy osteophites were found at the lower end of the metatarsal and an ulcerative process of the articular surface of the bone. The question seems to present itself: As long as the X-rays were followed by such improvement should it not suggest the propriety of a more prolonged course of similar treatment?—(*Veter. Record.*)

Bier's Treatment in a Bull Dog [*G. Mayall, M.R.C.V.S.*].—Bull dog, Prince, had eczematous sores about his head and hind paws. First he was treated with antiseptic baths, squeezing the sores under the water in the baths and dressing with boracic ointments and a few drops of pure carbolic acid. Calomel and antimony tartrate were given internally. After some relief and apparent cure, the trouble returned, the tarsus being swollen and with more or less discharge. Baths and lysol were resorted to and on each hind leg was put above the hocks an India rubber ring. These were left for two hours, morning and afternoon. After three days of this application the discharge stopped, the sores and swelling were reduced and recovery was radical.—(*Veter. Journ.*)

TETANUS IN DOG [*T. M. Inglis, M.R.C.V.S.*].—Fox terrier is suspected of rabies. But on proper examination was found suffering with tetanus. Six doses of antitetanic serum were administered, while the dog was kept in a dark cage and watched. About the 3d or 4th day he showed some improvement and gradually all the bad symptoms subsided. A small abrasion on one of the forepaws was probably the seat of infection.—(*Ibidem.*)

CAESARIAN SECTION IN A CAT [*H. C. Ganguli, Bengal Veterinary College*].—A white Indian cat was a case of distocia, she had been in pains for over 24 hours. Exploration per vagina revealed part of foreleg of foetus, whose head was twisted inside the womb. Attempts to deliver by the usual methods were quite futile. So the cat was laid on a table, parts of the abdominal walls shaved and disinfected, the animal was chloroformed and the abdomen opened. With aseptic measures, the abdominal cavity was entered and the left horn of the gravid uterus brought into view. The womb was carefully incised and a decomposed foetus removed, with all its covering. Thorough cleaning of the uterne cavity, suturing of the empty organ, that of the abdominal muscles and afterwards of the skin. Cleaning of the skin with lysol and a boro-iodoform collodion was applied. Antiseptic gauze and boric padding with moderate pressure concluded the operation, which was followed without much disturbance by recovery, except an elevation of temperature for two days. In one week the animal was in perfect health.—(*Ibidem.*)

TUBERCULOSIS OF THE BRAIN IN CATTLE [*Ernest J. Bandred, M.R.C.V.S., D.V.H.*].—The writer records two cases that he saw recently. One in a steer seen alive. It held its head and neck stiffly, with the nose poked out, and when made to move did so without turning the head. The history was that he had hurt his head with the tying-up chain. At the autopsy was found tuberculosis of the lungs and pleura with pharyngeal glands diseased. In the depth of the left hemisphere there was a tuberculous lesion about the size of a large hazel nut. The second case occurred in a cow, which was slaughtered because she had had a fit. At rough examination of the carcass no lesions were found and then the head was looked at. There was extensive tuberculosis in the region of the left condyle of the occipital bone, and when the brain was removed half of the left hemisphere was found also affected. The left pharyngeal gland was caseified. More care-

ful examination of the lungs and liver made afterwards showed small centers of tuberculosis.—(*Veter. Journ.*)

TUBERCULOSIS (?) IN A HORSE [*Capt. Graham Rees-Mogg*].—A horse brought to the writer had a nasty discharge from both nostrils. The history being that since he had pneumonia eighteen months before he had a discharge which varied in quantity at times, getting better and then worse. His temperature was 102 degrees F. The horse looks weak and is thin; he was very distressed. He was destroyed. The post mortem showed the right lung had hardly any normal tissue remaining it it. A small portion was in a state of grey hepatization. There were numerous gangrenous cavities with calcareous and caseous matter on their walls. The left lung contained four cavities with calcareous deposits and fibrous tissue in their walls. The bronchial and mediastine glands were diseased. Abdominal organs showed no lesions.

This animal had been able to perform military work since August to October, when he was killed.—(*Veter. News.*)

FRENCH REVIEW.

By PROF. A. LIAUTARD, M.D., V.M.

INCOMPATIBILITY OF DISINFECTION OF TINCTURE OF IODINE AND THE USE OF SUBLIMATE [*Dr. Karpelos*].—The incompatibility of the iodides and compounds of mercury is well known. It is also known that insufflation of calomel in the eyes of a patient, submitted to iodine treatment, may give rise to the most severe results, as the iodine, partly eliminated with the tears, forms, with the calomel, an irritating iodo-mercurial compound which can promote severe pains around the cornea and sometimes ulceration.

Called to treat a felon of the index, the author, after disinfecting the skin of that finger with tincture of iodine, made an incision, evacuated the pus and covered the region with gauze moistened with solution of sublimate at 1 to 1,000, with directions to the patient to pour every three hours a little of the solution over the dressing.

The next day the finger was very sore, covered with little vesicles, a dermatitis was present, which required 15 days to get well. If in a tube containing a solution of bichloride of mercury

at 1 to 10,000 two or three drops of tincture of iodine are poured in there will be formed a red precipitate of iodide of mercury, which has a great irritating power. This was the case in the above record.—(*La Semaine Medicale.*)

FILLING TEETH IN ANIMALS [*Dr. Emsloff*].—The writer makes a speciality of veterinary dentistry. He has already published the details of his modus operandi. The filling is made with an amalgam of copper, easy to work with, which is introduced in the tooth without violent pressure nor painful knockings. The matter moulds itself perfectly in all the anfractuosities of the tooth, is not attacked by saliva, does not retract with age, has no antiseptic action and stands perfectly the work of mastication.

Silicated cement has also some advantages, but cannot be used unless with complete absence of saliva, which renders its solid application difficult.

The instruments used by the doctor are the same as those used by human dentistry when working on teeth of dogs or incisives of horses. For molars of this last species instruments of various length are required.

The animal cast, or standing for incisives, cleaning of the cavity is made with scrapers, curettes, etc. The cavity is cleaned of all that may remain by a strong blowing with bellows, then follows a washing with hot water, disinfection with phenic acid, drying up by a spray of ether and another strong blowing. The tooth is filled with the amalgam, introduced in small lumps and firmly packed in until complete repletion of the cavity. The amalgam is hardened in two hours. During that time food must not be allowed, but the animal can drink without inconvenience. —(*Zeitsch. fur Veter. and Revue Gene.*)

TUMOUR OF SUPRARENAL IN A BOVINE [*Mr. C. Fairise.*].—It was situated at the antero-internal extremity of the left kidney of a cow. It was spherical, measured 15 centimeters in diameter and weighed 2 kilograms. Surrounded with a fibrous envelope, rather thick, it had hemorrhagic centers, parts in necrobiosis and pseudocysts containing gelatinous fluid. The histological aspect of the tumor was that of a perithelioma. The presence of elements resembling those of the supra renal capsule, suggested the thought of its being an epithelioma of that organ. Such tumors may exist in herbivorous animals enjoying perfect health; they have more a tendency to necrosis and calcification than generalization.—(*Revue Veter.*).

BACTERIAN FLORA OF NORMAL UDDER [*Harrison and Savage*].—The authors have made their researches on heifers, one and two years old, which had had no calves yet, and on seven cows. The flora of the udder consists of a very small number of microbian species, which are almost exclusively micrococci. The species found in the teats, put aside with the first streams of milk, are subject to variations. The flora of the remaining portion of the gland is practically constantly the same. If the flora of the lower regions of the gland is due to external contamination by the galactiforous canals, the flora of the glandular parenchyma seems on the contrary to have an internal origin. Microbes found in the lower part of the udder cannot penetrate in the superior secreting regions.—(*Bullet. Pasteur Institute.*)

STUDY ON A CASE OF CARDIAC "BLOCKING" IN DOG [*Dr. Bachmann*].—This affection, well studied in man, is also called "auriculo-ventricular dissociation." The number of ventricular pulsations is no longer equal to that of the auricular contractions. Auricles and ventricles seem to be independent, from a functional point of view. "*Blocking*" of the heart, partial or complete, is but one form of this dissociation. For instance, the exciting of the pneumo-gastric inhibits the auricles without having any influence on the ventricles. These are said to be "blocked." They do not obey or escape on excitation. In general, the ventricular contractions are less numerous than the auriculars, the result being a very marked slowness in the pulse.

These symptoms are due to a lesion of the auriculo-ventricular uniting band of the fasciculus. If this muscular bridge is destroyed, all functional relations are cut between the auricles and ventricles. The rythm is deeply disturbed. This trouble deserves attention, as the treatment differs from that of ordinary cardiopathies.

The relation of Bachmann is important, as it reveals the existence in the dog of a disease which clinically had yet been studied only in man. The lesions found at the post mortem were typical. The auricular septum presented conjunctive thickenings which were found also surrounding and pressing the fibres of the fasciculus of His, in all its extent. The auricular muscular structure was infiltrated with fat, above the fasciculus, which itself was fatty. The muscular fibres of communication between auricles and ventricles were considerably reduced in number. It will be a disease difficult to diagnose in dogs as it is a delicate operation to explore the jugular pulse to count the frequency of the auricular beatings.—(*La Semaine Medicale.*)

CORRESPONDENCE.

GONE, BUT NOT FORGOTTEN.

Nebraska Live Stock Sanitary Board,
LINCOLN, NEBRASKA, January 8, 1915.

AMERICAN VETERINARY REVIEW, 509 West 152d street, New York City, N. Y.:

Gentlemen.—I take this opportunity of submitting to you the following for publication:

In my opinion I feel sure that the veterinarians as a whole over the United States will regret to learn that Dr. A. Bostrom, former State Veterinarian of Nebraska, and for the past two years Chief of the Nebraska Stallion Registration Board, has resigned his recent position and expects to retire from active work.

In my opinion I can proudly say that Dr. Bostrom was one of the most conscientious, painstaking State Veterinarians that ever had the privilege of holding office in this great Universe.

I also wish to say that he was a man who did his own thinking. He was kind and generous to those with whom he came in contact, as long as they asked for what was fair, right and just, but had the stamina to refuse anything and everything that was not in accord with the advancement of our profession and protection of the live stock industry of this State.

Dr. Bostrom was one of the first State Veterinarians to investigate the interstate shipments of dairy cattle, leaving the infected districts of a couple of our central and eastern States.

In succeeding Dr. Bostrom in this office, I felt a great task before me, really one that I felt that I could not master to the satisfaction of the profession or the people as a whole, owing to the efficient and satisfactory work that Dr. Bostrom had given while he had charge of this department.

I have put forth every effort within my power to carry out many of the proficient systems that Dr. Bostrom established while he had charge of this office.

I am sure that the different State Veterinarians will miss Dr. Bostrom's instrumentality at the different national meetings held.

He was always present, and ready to answer the call of reading a well-prepared paper that no doubt would be of great enlightenment to any man who would hear him give his instructions and views to their branch of science and livestock protection.

May we all join and wish Dr. Bostrom a long and happy retired life.

Very truly yours,

L. C. KIGIN,
Deputy State Veterinarian.

BUILT IT HIMSELF.

SEYMOUR, INDIANA, January 11, 1915.

AMERICAN VETERINARY REVIEW, 509 West 152d St., New York, N. Y.:

Am sending you picture of new hospital built by myself.

This building is 50 by 70. Four box stalls 13 by 14; six open stalls 7½ feet wide; table in one corner; stalls dirt floor; main floor of barn concrete. Main office, private office and drug-room back of private office.

Dr. Lett's Veterinary Hospital.

Yours respectfully,

H. LETT, M.D.C.

A CORRECTION.

Michigan Agricultural College, East Lansing, Mich., January 15, 1915.

Editor AMERICAN VETERINARY REVIEW, New York City:

DEAR SIR—I desire to correct a statement accredited to the Columbus Ohio, *Citizen,* but published in the January issue of the REVIEW. The words to which I wish to take exception are: "Ohio State and Michigan are now the only two schools east of the Mississippi that permit students to enter this course (referring to veterinary medicine) without high school credits."

On the contrary, there has never been a time when students could enter the course in veterinary medicine at the Michigan Agricultural College with less than the equivalent of fifteen units of preliminary work. Further than this, the M. A. C. veterinary course is not only an advocate for higher education, but is a pioneer along such lines, as is amply evidenced in its present requirement. It stands alone among the colleges in the territory above referred to in demanding jointly high school graduation (minimum 15 units) and four years of college work for the degree of D.V.M. That it has successfully passed over the experimental stages of this high requirement is demonstrated by its present enrollment of more than half a hundred students.

Very truly yours,

R. P. LYMAN.

DOURINE IN NEBRASKA.

Nebraska Live Stock Sanitary Board,
Lincoln, Nebraska, January 9, 1915.

AMERICAN VETERINARY REVIEW, 509 West 152d street, New York City, N. Y.:

Gentlemen.—Again I take the opportunity to inform you, for publication, that dourine was found to exist in this State the past fall.

Upon investigation we found that this disease had crept into this State through a shipment of stallions and mares from the State of Wyoming. Immediately after finding that this disease existed in this State the Nebraska Live Stock Sanitary Board placed a quarantine on five counties, which prevents any stallion or mare from being shipped out of that territory.

Our Legislature is in session at present time, and this matter will be laid before them, and I am sure that a campaign against this disease will be started in the spring to eliminate it.

I might state that the Government was kind enough to detail a man to assist me in collecting 113 samples of blood, which we submitted for the complement-fixation test, and this test showed 5 positive reacters, and also 6 suspicious.

Yours truly,

L. C. KIGIN, *Deputy State Veterinarian.*

THE RIGHT MAN IN THE RIGHT PLACE.

Quincy, Massachusetts, January 8, 1915.

AMERICAN VETERINARY REVIEW, *New York:*

Dear Sirs.—The following item may be of interest to many of your subscribers:

The veterinarians of Massachusetts are very well satisfied with the action of Governor Walsh in placing even temporarily, but we hope permanently, into the office of CHIEF OF DEPARTMENT OF ANIMAL INDUSTRY, Dr. Lester Howard, of Boston, a veterinarian of marked ability and an active member of both the Massachusetts and the American associations. He is a man of fine presence, education and experience. He is a credit to the profession, and we believe him to be the right man in the right place.

Sincerely yours,

FRANCIS ABELE, JR.

DR. E. B. ACKERMAN, Chief Veterinarian to the Department of Health of Greater New York, tendered his resignation from the Department to Commissioner Goldwater early in January to take effect February 1. Dr. Ackerman has been connected with the department for more than 20 years.

THE Thanksgiving Day Horse Show held by the Speedway Club of Kansas City was a most successful affair. Several thousand people were in attendance, and it is an assured fact that henceforth the show will be an annual event.—(*The Horse Lover.*)

BIBLIOGRAPHY.

THE ANATOMY OF THE DOMESTIC ANIMALS.

THE ANATOMY OF THE DOMESTIC ANIMALS, by Septimus Sisson, S.B., V.S., Professor of Comparative Anatomy in the Ohio State University, Columbus, Ohio; Member of the American Association of Anatomists; Fellow of the American Association for the Advancement of Science. More than 900 pages, with 725 illustrations, many in colors. Second edition entirely reset. Philadelphia and London; W. B. Saunders Company, 1914.

This book takes the place of the same author's Text Book of Veterinary Anatomy, which appeared in 1910 and soon came to be recognized as the standard work on the subject in English-speaking countries. The new book is a large octavo volume of 930 pages, beautifully printed on paper of the best quality, and well bound in cloth or half-morocco. As a teacher of long experience, Professor Sisson evidently realizes that in anatomical treatises in particular the chief desideratum is an ample supply of good illustrations. The new Anatomy contains 725 figures, and it is quite safe to say that no other work on the subject approaches it in number and quality of illustrations. The great majority of the figures are original and are reproductions of photographs of anatomical material made by the author. This mode of illustration is a recent innovation in our anatomical literature, and the results are most striking, artistic beauty being combined with photographic accuracy in a remarkable manner. Colors have been freely used wherever it seemed desirable to facilitate ready reference and quick understanding of the figures; many illustrations are in three colors—a very valuable feature to the busy practitioner who may wish to refresh his memory in preparation for operative procedure.

The superficial observer might at first be inclined to regard the book as being somewhat large for a student's text, but a little more careful inspection will show clearly that the bulk is due to the large number and size of the illustrations, and not to any padding or prolixity in the text. Indeed, considerably more than half of the space is taken up by the figures. The descriptive statements are as brief as is possible consistent with intelligibility, and are very lucid and easily followed. Excellent judgment has been shown in the selection of matter of chief professional importance, and the exclusion or brief consideration of facts of less

interest. The use of bold-faced type for principal names and the careful paragraphing are valuable aids to the reader. The large amount of topography, both in text and illustrations, makes the book of special value in clinical work. The data in this regard are to a large extent the results of the author's own investigations; many of them are entirely new facts and others are corrections of current but incorrect views. They constitute an important contribution to our knowledge of the structure of our chief domesticated animals. Such contributions to veterinary science can be made only by well-trained men who will intensively and enthusiastically devote their energies to a chosen field of work.

In a work which covers so large a field it is not possible in a brief review to refer in detail to special features of the text. It may be noted that particular attention has been given to the lymphatic system; the description of this system in the Ox is much fuller than usual, a fact which will be appreciated by those engaged in meat inspection and other applications of pathology.

The nomenclature has been revised in accordance with the report of the Committee on Revision of Veterinary Anatomical Nomenclature of the A. V. M. A., adopted at the Indianapolis meeting. The changes made in this respect constitute a long step toward a more simple and uniform terminology. Substantial progress in this direction can be made only by co-operation, and personal preferences or prejudice should not be allowed to stand in the way of an elimination of much of our present anatomical Babel.

It is self-evident that a work of such magnitude and difficulty involves a great deal of labor, and the REVIEW congratulates Professor Sisson on the successful manner in which it has been accomplished. Great credit is also due the publishers for the production of a superb piece of book-making. In view of the very high cost involved in the publication of a book of this kind the price is to be regarded as quite reasonable.

DAIRY CHEMISTRY.

DAIRY CHEMISTRY, A PRACTICAL HANDBOOK FOR DAIRY CHEMISTS AND OTHERS HAVING CONTROL OF DAIRIES, by Henry Droop Richmond, F.I.C., Analyst to the Aylesbury Dairy Company, Limited. Second edition, revised. More than 400 pages, with numerous tables and 49 illustrations. London: Charles Griffin and Company, Limited, 1914.

The first edition of this work was exhausted more than seven years ago, and owing to the author's ill-health it has been impos-

sible to make the revision necessary sooner. So that by lapse of time certain portions of the text in the first edition have become obsolete, and these have been deleted and replaced by matter based on the latest investigations. It has been found necessary to rewrite many sections and to insert methods which have been devised since the first edition was published, which has involved the resetting of the work throughout, although no alteration has been made in the plan or scope. New illustrations have been introduced and the index greatly improved. The object of this work is to provide dairy chemists, medical and veterinary officers and dairy farmers with a guide for the chemical control of dairy operations. Chapter I—*Introductory—The Constituents of Milk;* Chapter II—*The Analysis of Milk;* Chapter III—*Normal Milk—Its Adulterations and Alterations and Their Detection;* Chapter IV—*The Chemical Control of the Dairy;* Chapter V—*Biological and Sanitary Matters;* Chapter VI—*Butter;* Chapter VII—*Other Milk Products;* Chapter VIII—*The Milk of Mammals Other Than the Cow;* Chapter IX—*Standardization and Calibration of Apparatus.* The author's own great experience as analyst to the Aylesbury Dairy Company is augmented by that of his predecessor for twelve years in the same capacity, Dr. Paul Vieth (now Professor in and Director of the Dairy Institute at Hamelin), who passed his accumulated observations of twelve years to his successor. So that the work is based upon observations of facts, rather than theory, the value of which is too obvious to require argument or emphasis. Cloth-maroon and gold.

FROM SECRETARY'S NOTES, N. A. B. A. I. E.—"I regret to report that National President Gibson has unfortunately suffered a severe injury while in the discharge of his official duties during the foot and mouth epidemic. He is now carrying a fractured rib, gotten from holding a 1,400 pound steer. He was successful in holding the steer, but the cruel caprice of fate is that he will carry the fractured rib to his grave. All members in corresponding with or interviewing members of congress should bear in mind that this is merely one of a large number of injuries suffered by Bureau employees engaged in the eradication of foot and mouth disease and eradication of hog cholera. The hazards connected with this work are such that it is unreasonable to expect Bureau employees to render an efficient service at the present inadequate rates of compensation."

SOCIETY MEETINGS.

CENTRAL NEW YORK VETERINARY MEDICAL ASSOCIATION.

The fifth semi-annual meeting of the Central New York Veterinary Medical Association was held at Syracuse, N. Y., on November 24, 1914. The following members were present: W. G. Hollingworth, H. A. Turner, W. B. Switzer, F. E. York, J. E. Pendergast, J. M. Currie, D. C. Papworth, W. M. Sullivan, E. E. Cole, E. E. Dooling, Frank Morrow, W. L. Clark, R. C. Hurlburt, R. M. Weightman, A. H. Ide, J. C. Stevens, J. V. Townsend, Frank Fowler, J. K. Bosshart, C. R. Guile, W. F. Burleigh and V. A. Moore. The association had as its guests Dr. P. A. Fish, President of the New York State Veterinary Medical Society, of Ithaca, N. Y.; Dr. Otto Faust, Vice-President of the New York State Veterinary Medical Society, of Poughkeepsie, N. Y.; Dr. J. G. Wills, State Veterinarian, Albany, N. Y.; Dr. D. D. LeFevre, of Newark, N. Y.; Dr. W. H. Saulsbury, Clifton Springs, N. Y.; and Dr. Winters, of Syracuse, N. Y. Merritt A. Switzer, Esq., attorney for the association, of Fulton, N. Y., was also in attendance.

The meeting opened at 10 o'clock, a. m., at the Infirmary of Dr. H. A. Turner, in South Salina street, where a clinic was held and the following subjects operated upon:

Case 1: Black horse belonging to the Syracuse fire department; nasal gleet; had previously been trephined in two places by Dr. J. A. Pendergast; re-trephined by Dr. Pendergast, assisted by Dr. Otto Faust.

Case 2: Gray gelding; navicular disease; median neurotomy performed by Drs. J. C. Stevens, H. A. Turner and W. L. Clark.

Case 3: Chestnut gelding; epithelioma; removed by Drs. Frank Morrow, A. H. Ide and W. L. Clark.

Case 4: Chestnut gelding; calculus in bladder; removed by Drs. A. H. Ide, E. E. Dooling and H. A. Turner.

Case 5: Roan gelding; poll-evil; operated on by Drs. H. A. Turner and J. A. Pendergast.

Case 6: Brown mare; median neurotomy; performed by Drs. J. A. Pendergast and H. A. Turner.

At the close of the clinic luncheon was served at the infirmary.

The business session was held at the St. Cloud Hotel at 2 o'clock p. m., President W. M. Weightman presiding.

An application for membership was received from Dr. W. J. Doyle and referred to the Board of Censors.

The prosecuting committee, through its attorney, reported that the action against Leo F. Horder for alleged illegal practice had been discontinued without costs to either party upon the agreement of Mr. Horder to discontinue practice until such time as he should be legally qualified, it appearing that he had entered a preparatory school. Upon motion, duly made and carried, the secretary was instructed to extend to Mr. Horder the good will of the association in view of his effort to become qualified.

The privilege of the floor having been granted to the visitors, Dr. Fish spoke upon the newly organized Southern Tier Veterinary Medical Association and extended to this association the invitation of that body to attend its meetings. Dr. Otto Faust, of the Hudson Valley Veterinary Medical Association, also recently organized, told the members of the success of that organization.

The President appointed Drs. Stevens, Dooling and Currie members of the prosecuting committee for the current year.

Papers were presented by the following members:

Dr. Frank Morrow, Utica, N. Y., "Some of the Cases We Meet in Dog Practice."

Dr. P. A. Fish, Ithaca, N. Y., "Bob Veal."

Dr. V. A. Moore, Ithaca, N. Y., "Hog Cholera."

Dr. C. R. Guile, Fulton, N. Y., "Case Report."

Dr. Otto Faust, Poughkeepsie, N. Y., "Some Interesting Cases in My Practice."

Dr. W. G. Hollingworth, Utica, N. Y., "The Veterinarian Should Advocate Humane Methods."

Dr. M. W. Sullivan, Marcellus, N. Y., "A Very Peculiar Bowel Case."

Dr. J. G. Wills, State Veterinarian, Albany, N. Y., address, "Foot-and-Mouth Disease."

Dr. P. A. Fish, as President of the New York State Veterinary Medical Society, in connection with his paper, called upon the members to give loyal support to the State Society and outlined the work before that body.

The papers presented at this meeting were the most carefully prepared and the most interesting of any yet given before this association and called forth very helpful discussions.

No other business appearing, the meeting was regularly adjourned and the members banqueted at the hotel.

W. B. SWITZER, *Secretary.*

OHIO STATE VETERINARY MEDICAL ASSOCIATION.

The Ohio State Veterinary Medical Association held its thirty-second annual meeting at the Ohio State University, Columbus, on January 6th and 7th. The sessions were largely attended, about three hundred veterinarians being present. The harmony and unusual interest which have characterized the last few annual meetings have convinced us that the veterinarians of Ohio have developed a professional interest in each other and in the profession which is of an increasingly pleasing magnitude. Never was the profession in Ohio in a more encouraging condition than right now.

The features of the program, which was excellent throughout, were: *The Foot and Mouth Disease in Ohio,* Dr. Marion Imes, B.A.I., Inspector in charge of Ohio; *The Progress of Hog-cholera Eradication in Ohio* (with special reference to Fayette County), Dr. Paul Fischer, State veterinarian; *The European Tour of the A. V. M. A.,* Dr. E. H. Shephard, Cleveland; *The Veterinarian and The Agriculturist,* A. P. Sandles, President Agricultural Commission of Ohio. The closing address, which proved to be the real feature of the meeting, was on *"The Veterinarian Himself,"* by Dr. John Adams, Professor of Surgery, University of Pennsylvania. Would that every veterinarian in our great Union could have heard Dr. Adam's address, for it has been and will long continue to be of inestimable value to those present.

The dinner session, which was held January 6th, at 6.30 p. m., in the Ohio Union, O. S. U., reminded one more of an A. V. M. A. banquet than that of a State Association meeting. One hundred and ninety sat down to this turkey dinner, and the success of the occasion promises even a larger attendance at this delightful and very essential session of our next meeting. The retiring officers were profusely congratulated on the success of every feature of the sessions.

The election of officers for the ensuing year resulted as follows; President, Dr. F. F. Sheets, Van Wert; Vice-president, Dr. Reuben Hilty, Toledo; Treasurer, Dr. David S. White, Columbus; Secretary, Dr. F. A. Lambert, Columbus.

F. A. LAMBERT, Secretary.

NEWS AND ITEMS.

ANTI-TUBERCULOSIS LEAGUE ACTIVE: We see by a recent issue of one of the Lawrence, Mass., dailies that the ANTI-TUBERCULOSIS LEAGUE of that city, of which Dr. John F. Winchester is a member, has been very active recently. Other members of the league are clergymen, laymen and women.

INTELLIGENCE IN HORSES.—Horses chosen for the military service show marvelous intelligence and quickness in adapting themselves to its requirements, says Denver *Field and Farm.* They learn the bugle calls and the evolutions sooner, as a rule, than the average recruit. The quickly acquire a uniform gait, which is about the same as the route or usual marching step. If the horses did not fall habitually into the same gait as the infantry, there would be varying distances between the different arms of the service. In the drills in the artillery service the horses preserve their alignment as well as the infantry ranks. It is remarkable how quickly the army horse learns the bugle calls and their significance. Let the first note of the feed or water call be sounded, and instantly there will be stamping, kicking and neighing among the horses, impatient for that call to be answered. Once during a storm at night in a camp the horses were seized with such terror that those of nearly every battery broke loose and went scattering about in their fright. The next morning there was a wild rush by the artillerymen to capture the horses. All was excitement, and the still-alarmed horses refused to be taken. An officer ordered the bugler to sound the feed call. He gave the call and instantly horses from every direction came dashing into that battery and the equine discipline was soon restored. When it comes to battle the trained army horse seems to know everything that is going on and the reason for it, and does his duty nobly. He enters into the spirit of the fight like his human comrades.—(*The Horse Lover.*)

SERIOUS MISUSE OF GOVERNMENT FIGURES BY MAKERS OF HOG-CHOLERA REMEDY.*

WASHINGTON, D. C.—The attention of the Bureau of Animal Industry of the United States Department of Agriculture has

*Office of Information, U. S. Dept. of Agriculture.

been called to the fact that the makers of a medicine sold as a hog-cholera remedy are misusing Government figures of the results obtained by Federal agents by the use of antihog-cholera serum, as evidence of the efficacy of their medicine. In several magazines there have appeared reading notices in which there are statements that this medicine has resulted in saving many hogs from hog cholera in Pettis County, Missouri, Montgomery County, Indiana, and Dallas County, Iowa. The figures given to indicate the results are exactly those reported to the Department by its agents as showing the use and effect of antihog-cholera serum in sick herds.

For example, the Government figures on the use of serum, which are misused in this way by the medicine concern, are as follows:

Pettis County, Mo.—	
Hogs in infected herds treated	5,904
Hogs lost	1,038
Montgomery County, Ind.—	
Number of sick hogs in infected herds treated	4,562
Hogs lost	894
Dallas County, Iowa—	
Number of sick hogs in infected herds treated	5,686
Hogs lost	1,998

It is scarcely possible that any remedy could have been used on identically the same number of hogs and with exactly the same results as the antihog-cholera serum. On this point the Inspector in charge in Pettis County, Missouri, states: "As far as we are able to ascertain none of this remedy has been used in Pettis County."

Farmers and others, therefore, are warned not to confuse this "remedy" with the antihog-cholera serum, which is the one method of treatment used by the Federal Department of Agriculture.

MORE HORSES IN NEW YORK CITY THAN EVER BEFORE—111,000, ACCORDING TO EQUINE CENSUS.—In its effort to stamp out glanders, perhaps the most insidious and dangerous disease that horseflesh is heir to, the State veterinary authorities, acting under the direction of the Commissioner of Agriculture, have just completed the first horse census ever undertaken in New York.

Breeders, owners, dealers and horse fanciers generally will be interested in knowing that it discloses an equine pouplation of 110,144, which is many times larger than the number of automobiles in the city, even including the dead ones, and probably is greater than the whole number of motor vehicles in use in the State. The Borough of Manhattan alone has 56,434 horses, and there are 36,184 in Brooklyn, 8,600 in the Bronx, 5,583 in Queens, and 3,343 on Staten Island.

Experts have frequently tried to estimate the number of horses in New York, but it is believed that no one ever guessed up to the actual total as disclosed by the State census just taken. The late J. D. Carroll, treasurer and general manager of the Fiss, Doerr & Carroll Horse Company, fixed the number at about 100,000 a few years ago, and this turns out to have been a close guess, for despite the activities of the automobile makers and dealers the number of horses has kept increasing from year to year and is now probably 10,000 larger than it was when Mr. Carroll made his reckoning.

Besides, counting all the horses the State authorities counted all the stables in the city and tabulated them as to character, sanitary condition, ventilation, ownership and number of horses, and then cross indexed these statistics by the card system, so that hereafter full information will be at hand concerning every important detail of the equine population.

Dr. H. D. Gill, who had charge of the canvass, says that the records just collected will be of inestimable value to the authorities in dealing with the problem of stamping out glanders. By a system of inspection and records not unlike those of the dairy farms now under State supervision the veterinarians expect to be able to locate at once all outbreaks of glanders and prevent the disease from spreading, as it has done in the past. Owners who fail to provide healthy quarters for their horses will, it is expected, be quickly singled out, and the officials will have authority to make them mend their ways or give up their horses. Stables in which repeated attacks occur will be fumigated, sterilized and put in thorough sanitary condition or else closed to the keeping of horses.

One of the important features of the new card index system is that it will enable the veterinary authorities to trace any particular horse from one stable to another, wherever he may go in the city, and thus guide the doctors in keeping watch of all animals with which a diseased horse may have come in contact. If necessary

each stable where a glandered horse has been kept can be quarantined until its inmates have been tested for disease, thus cutting off the chances of communication to healthy horses.

Though the Borough of Manhattan has 20,250 more horses than Brooklyn, it has less than one-half as many stables. The Borough across the bridges has, indeed, almost as many stables as all the rest of the city taken together. Its 36,184 horses are housed in 5,261 different buildings, while in Manhattan there are only 2,130 stables for 56,434 horses. The average number of horses in a stable is thus more than twenty-six on this side and seven on the other side of the East River. Staten Island, however, has more room for its horses than Brooklyn or any other Borough has, the average there being less than three occupants to each barn. The following table, furnished by Dr. Gill, shows the records for the five Boroughs:

Borough	No. Horses.	No. Stables.	Average.
Manhattan	56,434	2,130	26½
Brooklyn	36,184	5,261	7
Bronx	8,600	1,216	7
Queens	5,583	1,167	4½
Richmond	3,343	1,306	2½
Totals	110,144	11,080	10

In connection with the new records of the city's equine inhabitants Dr. Gill and his associates are now putting into effect a system of identifying the horses by fastening a sealed band around the neck of each animal that is tested for glanders. The band carries a number, and in time it is expected that each horse in the city will be registered in this way, so that he can be located at any time and his history traced from the time he arrives in New York until he leaves the city.—(*The Horse Lover.*)

A Summary of the Situation on Foot and Mouth Disease Deducted from a Report to the Office of the United States Live Stock Sanitary Association to January 13, 1915: *Connecticut* has eight counties under federal and state quarantine, and does not know when the state will be entirely released. Probably not before February 1. *Delaware* has only

one county now under federal quarantine; had three counties quarantined since early in November until December 17. *Indiana* had eighteen counties under state quarantine from beginning. Now have privilege of moving stock on farms for purposes other than immediate slaughter. Sixteen other counties have been placed under quarantine by the federal government against interstate shipment on account of the disease being within fifteen miles of their borders. Nine more counties will probably soon be released. *Iowa* has fifteen counties under both federal and state quarantine; nine of which are permitted to ship stock to slaughter without inspection; no infection has been found in them. The foot and mouth disease infection having been confined to Iowa, Jones, Cedar, Jackson, Johnson and Clinton counties, from which shipments must be inspected by collaborating veterinarians appointed by the B. A. I. If no further outbreaks occur, Iowa will be released about February 1. *Illinois.* No official report. It is understood that objection from owners to control and slaughter methods pursued by federal and state officials culminated in a temporary injunction issued January 11, by Judge Irwin, Kane County Circuit Court, sitting at Elgin. This injuncion restrains the State Veterinarian from the slaughter of a herd of 40 cattle at St. Charles, Illinois, scheduled for slaughter January 12. While the injunction effectually halts the slaying of infected or exposed cattle for the time being, it may be dissolved at a subsequent hearing, if the state authorities can convince the court that no other method of handling the disease will cope with the situation. The petition on which the injunction was granted alleged: "That the hoof and mouth disease is not necessarily fatal and can be stamped out by quarantine. That there has been no appropriation by the state to reimburse farmers for losses. That the state law under which the slaughter has been ordered is unconstitutional and that it is an unjust burden to taxpayers." *Kentucky.* Losses in Kentucky on account of foot and mouth disease, 817 cattle, 308 hogs. Disease found in eight counties only. *Maryland* has ten counties under quarantine; but the whole state is under quarantine as far as shipment of cattle is concerned. Impossible to state when the federal quarantine will be raised. *Massachusetts.* The whole state is under quarantine, but which is being rapidly modified under the permit system, allowing rather free movement of cattle excepting in or immediately adjacent to infected premises. *Michigan* has nineteen counties under federal quarantine, and thirty-three townships under state quarantine.

At one time the federal government had the entire state under quarantine but has now released all but nineteen counties. It is expected that the entire state will be released by the end of January. *Montana.* Entire state of forty-one counties was under federal quarantine; now reduced to three counties. Hope to be entirely released by end of January. *New Hampshire.* Two counties were quarantined by both state and federal governments. Federal government has not yet raised their quarantine of those counties; although the state has released them except as applying to a few towns in the immediate vicinity of where the disease broke out. There were only three cases in the state, all at the same place. *New Jersey* has no cases of foot and mouth disease at present, although several suspicious cases still under observation. Still under federal and state quarantine and impossible to tell when it will be released, but probably in a few weeks. *New York* was quarantined by the federal government, and the state quarantined its sixty-two counties. The federal quarantine has since been raised from thirty-four counties, leaving twenty-eight still under federal quarantine. Up to January 5, seventy herds had been affected and 3,500 cattle slaughtered. Of these 600 head, killed under the most careful state and federal inspection, have been passed for food. Hope for modification of the federal quarantine within the next few weeks is entertained. *Ohio.* Entire state was placed under federal quarantine; actual disease found only in thirty of the eighty-eight counties, except Cuyahoga county in which a carload of diseased cattle was shipped, but they were destroyed immediately without exposure. Last outbreak in state, January 1. *Pennsylvania* originally had its entire state comprising sixty-seven counties under federal and state quarantine. This was modified from time to time, until on the date of their report to the office of the U. S. Live Stock Sanitary Association (January 4) there were but 25 counties under quarantine. Further modification was anticipated two weeks later. *Rhode Island* had all counties in the state under quarantine, but had two released at time of their report. *Virginia* had but one outbreak in the state. The infected cattle, seventeen steers that had come from Maryland, were killed by the federal authorities in co-operation with the state men. No other cases in the state. The county where the herd was destroyed is under quarantine, both federal and state. *Wisconsin* had thirteen counties under quarantine, several of which had been released in whole or in part at the time of the report (December 30, 1914). The extent of the disease in two counties could not be estimated at that time.

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary.
Alabama Veterinary Med. Ass'n	Mar. 5-6-7, 1914	Auburn	C. A. Cary, Auburn.
Alumni Ass'n, N. Y.-A. V. C.	June 10, 1915	141 W. 54th St.	P. K. Nichols, Port Richmond, N.Y.
American V. M. Ass'n.	Pending	New Orleans, La	Nelsen S. Mayo, 4753 Ravenswood Ave., Chicago, Ill.
Arkansas Veterinary Ass'n	January 5-6, 1915	Little Rock	R. M. Gow, Fayetteville.
Ass'n Médécale Veterinare Française. "Laval"	1st and 3d Thur. of each month	Lec. Room, Laval Un'y, Mon.	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago	2d Fri. each month.	Chicago	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., So. Omaha	3d Mon. each month.	S. Omaha, Neb.	E. J. Jackson, So. Omaha.
Buchanan Co. Vet. Ass'n	Monthly.	St. Joseph	F. W. Caldwell, St. Joseph, Mo.
California State V. M. Ass'n	December 10, 1913.	San Francisco	John F. McKenna, Fresno.
Central Canada V. Ass'n.	Feb. and July	Ottawa	A. E. James, Ottawa.
Central N. Y. Vet. Med. Ass'n	June and Nov.	Syracuse	W. B. Switzer, Oswego.
Chicago Veterinary Society	2d Tues. each month.	Chicago	D. M. Campbell, Chicago.
Colorado State V. M. Ass'n	January, 1914	Denver	I. E. Newsom, Ft. Collins.
Connecticut V. M. Ass'n.	Feb. 2, 1915	Hartford	B. K. Dow, Willimantic.
Delaware State Vet. Society	Jan., Apl., July, Oct.	Wilmington	A. S. Houchin, Newark, Del.
Essex Co. (N. J.) V. M. A.	3d Mon. each month.	Newark, N. J.	J. F. Carey, East Orange, N. J.
Genesee Valley V. M. Ass'n	2d week, July, 1913.	Rochester	J. H. Taylor, Henrietta.
Georgia State V. M. A	Dec. 22-23, 1913	Atlanta	P. F. Bahnsen, Americus.
Hamilton Co. (Ohio) V. A			Louis P. Cook, Cincinnati.
Illmo Vet. Med. Ass'n.	Nov. 20, 1914	E. St. Louis	L. B. Michael, Collinsville, Ill.
Illinois State V. M. Ass'n	Dec. 3-4-5, 1914	Chicago	L. A. Merillat, Chicago.
Indiana Veterinary Association	Jan. 14, 1914	Indianapolis	A. F. Nelson, Indianapolis.
Iowa Veterinary Ass'n.	Feb. 9-10-11, 1915	Cedar Rapids	C. H. Stange, Ames.
Kansas State V. M. Ass'n.	Jan. 5-6, 1915	Topeka	J. H. Burt, Manhattan.
Kentucky V. M. Ass'n.	Oct. & Feb. each year.	Lexington	Robert Graham, Lexington.
Keystone V. M. Ass'n.	2d Tues. each month.	Philadelphia	Cheston M. Hoskins.
Lake Erie V. M. Association	Pending	Pending	Phil. H. Fulstow, Norwalk, Ohio.
Louisiana State V. M. Ass'n.	Sept., 1914	Lake Charles	Hamlet Moore, New Orleans, La.
Maine Vet. Med. Ass'n.	Jan. 27, 1915	Augusta	H. B. Wescott, Portland.
Maryland State Vet. Society		Baltimore	H. H. Counselman. Sec'y.
Massachusetts Vet. Ass'n.	4th Wed. each month.	Young's, Boston.	W. T. Pugh, Southbridge.
Michigan State V. M. Ass'n.	Feb. 2, 3, 1915	Lansing	W. A. Ewalt, Mt. Clemens.
Minnesota State V. M. Ass'n.	Jan. 13-14-15, 1915	St. Paul	G. Ed. Leech, Winona.
Mississippi State V. M. Ass'n.	1914	Vicksburg	J. D. Townsend, Louisville.
Missouri Valley V. Ass'n.	Feb. 2-3-4, 1915	Kansas City, Mo.	Hal. C. Simpson, Denison. Ia.
Mississippi Valley V. M. Ass'n.	Semi-Annually	Galesburg, Ill.	G. E. McIntyre, Alexis, Ill.
Missouri Vet. Med. Ass'n.	July, 1915	St. Louis	Chas. D. Tolse, Kansas City.
Montana State V. M. A.	Sept. 24, 25, 1913	Helena	A. D. Knowles, Livingston.
Nat'l Ass'n B. A. I. Employees	2d Mon., Aug., 1915.	New York, N. Y.	S. J. Walkley, 185 N. W. Ave., Milwaukee, Wis.
Nebraska V. M. Ass'n.	1st Mo. & Tu., Dec. '13	Lincoln, Neb	Carl J. Norden, Nebraska City.
New York S. V. M. Soc'y.	1915	Ithaca	H. J. Milks, Ithaca, N. Y.
North Carolina V. M. Ass'n.	June 23, 1914	Wilson	J. P. Spoon, Burlington.
North Dakota V. M. Ass'n.	Week of July 20, 1914	Fargo	A. F. Schalk, Agricultural College.
North-Western Ohio V. M. A.	Nov. 1913.	Delphos	E. V. Hover, Delphos.
Ohio State V. M. Ass'n.	Jan. 13-14, 1916	Columbus	F. A. Lambert, Columbus.
Ohio Soc. of Comparative Med.	Annually	Upper Sandusky.	F. F. Sheets, Van Wert, Ohio.
Ohio Valley Vet. Med. Ass'n.			J. C. Howard, Sullivan.
Oklahoma V. M. Ass'n.	Fall, 1913	Oklahoma City.	C. E. Steel, Oklahoma City.
Ontario Vet. Ass'n.	1st Week in Feb. 1914	Toronto	L. A. Willson, Toronto.
Pennsylvania State V. M. A.	March 2, 3, 1915	Philadelphia	John Reichel, Glenolden.
Philippine V. M. A.	Call of President	Manila	David C. Kretzer, Manila.
Portland Vet. Med. Ass'n.	4th Tues. each month.	Portland, Ore.	Sam. B. Foster, Portland, Ore.
Province of Quebec V. M. A.		Mon. and Que.	Gustave Boyer, Rigaud, P. Q.
Rhode Island V. M. Ass'n.	Jan. and June	Providence	J. S. Pollard, Providence.
South Carolina Ass'n of Veter'ns.	Pending	Pending	B. K. McInnes, Charleston.
South Illinois V. M. and Surg. Ass'n.	Aug. 3, 1915	Centralia	F. Hockman, Iola.
St. Louis Soc. of Vet. Inspectors	1st Wed. fol. the 2d Sun. each month.	St. Louis	Wm. T. Conway, St. Louis, Mo.
Schuylkill Valley V. M. A.	Dec. 16, 1914	Reading	W. G. Huyett, Wernersville
Soc. Vet. Alumni Univ. Penn.		Philadelphia	B. T. Woodward, Wash'n, D. C.
South Dakota V. M. A.	Pending	Madison	S. W. Allen. Watertown.
Southern Aux. of Cal. S. V. M. Ass'n.	Jan. Apl., July, Oct.	Los Angeles	J. A. Dell, Los Angeles.
South St. Joseph Ass'n of Vet. Insp.	4th Tues. each month	407 Illinois Ave.	H. R. Collins, South St. Joseph.
Tennessee Vet. Med. Ass'n.	November, 1914	Nashville	O. L. McMahon, Columbia.
Texas V. M. Ass'n.	Nov., 1913	College Station.	Allen J. Foster, Marshall.
Twin City V. M. Ass'n.	2d Thu. each month.	St. P.-Minneap.	M. H. Reynolds, St. Paul, Minn.
Utah Vet. Med. Ass'n.	Spring of 1914	Salt Lake City.	E. J. Coburn, Brigham City.
Vermont Vet. Med. Ass'n.			G. T. Stevenson, Burlington.
Veterinary Ass'n of Alberta			C. H. H. Sweetapple, For. Saskatchewan, Alta., Can.
Vet. Ass'n Dist. of Columbia	3d Wed. each month	514 9th St., N.W	M. Page Smith, Washington, D. C.
Vet. Med. Ass'n, Geo. Wash. Univ.	1st Sat. each month.	Wash'ton, D. C.	J. M. Cashell, 2115 14th Street.
Vet. Ass'n of Manitoba.	Feb. & July each yr.	Winnipeg	Wm. Hilton, Winnipeg.
Vet. Med. Ass'n of N. J.	Jan. 14, 1915	Trenton	E. L. Loblein, New Brunswick.
V. M. Ass'n, New York City	1st Wed. each month.	141 W. 54th St.	R. S. MacKellar, N. Y. City.
Veterinary Practitioners' Club.	Monthly.	Jersey City	T. F. O'Dea, Union Hill, N. J.
Virginia State V. M. Ass'n.	July 9-10, 1914	Staunton	Geo. C. Faville, North Emporia.
Washington State Col. V. M. A.	1st & 3d Fri. Eve.	Pullman	R. J. Donohue, Pullman.
Washington State V. M. A.	June, 1915	Yakima	Carl Cozier, Bellingham.
Western N. Y. V. M. A.	June 24, 1914	Buffalo	W.E. Fritz, 358 Jefferson St., Buffalo
Western Penn. V. M. Ass'n.	3d Thu. each month.	Pittsburgh	Benjamin Gunner, Sewickley.
Wisconsin Soc. Vet. Grad.	Feb. 10, 11, 1914	Milwaukee	W. W. Arzberger, Watertown.
York Co. (Pa.) V. M. A.	June, Sept., Dec., Mar	York	E. S. Bausticker, York, Pa.

PUBLISHERS' DEPARTMENT.

Subscription price, $3 per annum, invariably in advance; Canadian subscriptions, $3.25; foreign countries, $3.60; students while attending college, $2; Students in Canada, $2.25; single copies, 30 cents in U. S. **Copy for advertisements should be received by 10th of month.**

Rejected manuscripts will not be returned unless postage is forwarded.

Subscribers are earnestly requested to notify the Business Manager immediately upon changing their address. **Make all checks or P. O. orders payable to American Veterinary Review.**

ONLY GRADUATE LICENSED VETERINARIANS can get the *Anti-Hog Cholera Serum* from the Moreland Biological Farm, of the PITMAN-MOORE COMPANY. That fact should be thoroughly appreciated by the legal practitioners of the country, and no doubt is. Read it for yourself in their advertisement on page 3 of the present issue.

A GOOD HORSE SLING is always useful, just as a poor one is always a nuisance; but at this season of the year, from one cause and another, we find the sling in greatest demand, and our attention is naturally directed to its superior features and its bad ones. On page 8 of this issue SHARP AND SMITH advertise one with superior features. Look it over, and when you write them, do not forget that you saw it in the REVIEW.

IN A POSITION TO SUPPLY ALL DEMANDS: Under date of January 11, 1915, we were in receipt of the following announcement from the Pasteur Laboratories of America, whose advertisement appears on page 20 of this issue:

"Professor R. W. Ellis, New York City:

"Dear Doctor—We have received many inquiries *re* our ability to supply *Pasteur's Anthrax Vaccine* for the coming season. We would very much appreciate if you would announce through your valued publication that we will be in a position to supply all demands for this vaccine as well as for all *Pasteur Institute* products, including Professors Leclainche & Vallee's Blackleg Vaccine, an improved form requiring a single injection.

"We come to you with this request in the interest of the profession as well as ourselves.

"Thanking you in advance for your kind services, we remain,

"Most cordially yours,

"PASTEUR LABORATORIES OF AMERICA."